

(19)



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(11)

**EP 0 945 235 B1**

(12)

**EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
12.02.2003 Bulletin 2003/07

(51) Int Cl.7: **B27D 5/00**, B27G 11/00,  
B29C 63/00

(21) Application number: 99830166.7

(22) Date of filing: 23.03.1999

(54) **A panel edge banding device**

Kantenleimgerät

Machine de collage des bords d'une pièce en forme de plaque

(84) Designated Contracting States:  
DE FR GB IT

(30) Priority: 24.03.1998 IT BO980189

(43) Date of publication of application:  
29.09.1999 Bulletin 1999/39

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**WO-A-97/05993** **DE-A- 3 517 194**

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**EP 0 945 235 B1**

## Description

[0001] The present invention relates to a device for applying edge banding to panels, especially panels of various different shapes, made of wood, plastic or similar materials and used preferably to make items of furniture.

[0002] At present, the operation by which edge banding, usually a strip of synthetic material, is glued to the edges of panels with curved profiles is carried out using equipment of various kinds, based on the different constructional principles followed by different manufacturers of woodworking machinery.

[0003] This equipment consists basically of a work table on which the panel to be edged is placed and means for applying the edging. The work table and the means for applying the edging move relative to each other so that the edging can be glued right round the perimeter of the panel.

[0004] By way of example, one solution for a piece of equipment of this kind is disclosed in German patent application DE - OS 35.17.194 in which the work table, with the panel on it, can rotate about a vertical axis, while the edge banding application means, comprising a roller that presses on the edge band while the latter is being fed, are driven only along the longitudinal axis of the machine in such a way as to copy the profile of the panel as it comes into contact with the pressure roller.

[0005] A more recent solution is disclosed in patent publications EP 276.358 and EP 510.231 which describe an apparatus that has a fixed table, to which the panel is secured, and a carriage equipped with an arm that mounts the devices for feeding the edge band, applying the edge band, machining the edge and cutting off the edge band. The carriage moves along two controlled axes X and Y above and in parallel with the surface of the panel to apply the edge band to the panel and finish the edge.

[0006] These solutions envisage the use of pre-glued edge banding which, just before being applied to the panel, is heated in such a way as to reactivate the glue. The disadvantage of this method is that, since the amount of glue forming the layer of pre-applied glue must be limited, it is not always enough to "cover" the pores in the edge of the panel. In short, machines of this kind sometimes work with "less than sufficient glue".

[0007] There are also "through" machines, that is to say, linear edge banding machines designed to apply edge bands to panels with straight edges and in which the panel is fed relative to the edge banding device, which remains fixed: with these machines, the glue may be applied either to the panel or to the edge band.

[0008] The aim of the present invention is to overcome the disadvantages mentioned above by providing a panel edge banding device that is extremely easy to use, compact, adaptable to panels of any shape, quick to install and capable of securely joining the panel edge to the edge band with glue.

[0009] The technical characteristics of the invention according to the above mentioned aims are described in the claims below and the advantages of the invention will become more apparent from the detailed description which follows, with reference to the accompanying drawings, which illustrate preferred embodiments of the invention and in which:

- Figure 1 shows a panel machine equipped with the edge banding device made according to the present invention, in a schematic top plan view with some parts cut away in order to better illustrate others;
- Figure 2 shows the panel edge banding device made according to the present invention in a perspective view, scaled-up compared to Figure 1 and with some parts cut away in order to better illustrate others;
- Figure 3 is a top plan view, with some parts cut away in order to better illustrate others, of the panel edge banding device as shown in Figure 2;
- Figure 4 is a top plan view, with some parts cut away and others in cross section, of some of the working parts of the device shown in the illustrations listed above;
- Figure 5 is a schematic top plan view, with some parts cut away in order to better illustrate others, of some of the drive parts of the device disclosed herein;
- Figures 6 to 9 are schematic top plan views of a series of working configurations that can be obtained with the device disclosed on a panel with a straight and concave profile;
- Figures 10 to 13 are schematic top plan views of a series of working configurations that can be obtained with the device disclosed on a panel with an angled profile;
- Figure 14 is a scaled-up detail of Figure 3, viewed from "J", showing a unit consisting of two pressure rollers in a side view with some parts in cross section and others cut away;
- Figures 15 and 16 are perspective views from below and above, respectively, and with some parts cut away in order to better illustrate others, of the twin-roller unit illustrated in Figure 14, equipped with means for adjusting the position of the rollers;
- Figure 17 is a schematic top plan view, with some parts cut away in order to better illustrate others, of another embodiment of the working parts illustrated in Figure 5;
- Figure 18 shows the device made according to the present invention in a perspective view from K in Figure 3;
- Figure 19 is a side view, with some parts cut away in order to better illustrate others, of the device illustrated in Figure 18;
- Figure 20 is a perspective, exploded view of a part of the device disclosed showing the means for suspending a glue unit and an edge banding feed unit;

- Figure 21 is a longitudinal section of the area where the glue unit and the edge band feed unit are suspended, also showing some parts in perspective and partly cut away in order to better illustrate others;
- Figures 22 and 23 are top plan views, with some parts in cross section, of another embodiment of the edge band feed unit in two different working configurations;
- Figure 24 is a top plan view, with some parts in cross section, of yet another embodiment of the edge band feed unit shown in Figures 22 and 23;
- Figure 25 illustrates a part of the glue and edge band feed unit in a perspective view with some parts cut away in order to better illustrate others;
- Figure 26 illustrates a detail of Figure 25 in a schematic side view;
- Figure 27 is a perspective, exploded view of a plate that forms part of an upper cover of the glue and edge band feed unit, showing also some parts of the drive gear with reference to Figure 21;
- Figure 28 is a side view, with some parts in cross section, of an end trimming tool that can be applied to the edge banding device disclosed;
- Figure 29 is a top plan view, with some parts cut away in order to better illustrate others, of a feed cylinder drive unit;
- Figures 30 and 31 show the pair of pressure rollers in a front view and a perspective view, respectively, and with some parts cut away in order to better illustrate others;
- Figure 32 is a top plan view of a part of the pair of pressure rollers shown in Figures 30 and 31;
- Figure 33 is a cross section through line XXIII-XXIII in Figure 32.

[0010] With reference to the accompanying drawings, described above, in particular, Figure 1, the device disclosed herein applies edge banding to panels 1 made of wood or other wood-based material, plastic or similar material and used preferably to make items of furniture.

[0011] As shown in Figure 1, the edges of the panels 1 may have differently shaped profiles, for example, convex, angled or concave, and the edge banding should preferably but not necessarily be applied uninterruptedly right around the panel 1.

[0012] The panels 1 can be processed in machines whose basic structure consists of at least one work table 2 on which the panel 1 is securely held, and application means 3 for gluing an edging band 4 to an edge 1b of the panel 1 in a defined direction B.

[0013] The application means 3 and the work table 2 can move relative to each other and, in Figure 1, by way of example, they move along defined axes, the application means 3 along an axis X on a crossbar 48 equipped with a rail 49 on which the application means 3 run in both directions, while the work table 2 runs along an axis Y perpendicular to the axis X (in the case illustrated, the

feed direction B is opposite to the feed direction B1 of the table 2 with the panel 1 on it).

[0014] Obviously, this machine is illustrated by way of example only and the device can be applied to other types of machines without departing from the scope of the inventive concept.

[0015] The application means 3 (see also Figures 2 and 3) consist of a unit with a motor-driven, tubular shaft 5, that forms a vertical main axis Z and that mounts and, through motors and appropriate drive gear (not illustrated) located inside the shaft 5, drives the following items: a contact roller 6, which, as explained in more detail below, may also be used to apply glue to the edge 1b of the panel 1, said roller 6 rotating about its vertical axis, which coincides with the main axis Z; a first main pressure roller 8 of the edge band 4 and glue feed means 7. The last two items are positioned on opposite sides of the roller 6 and can oscillate about the main axis Z in accordance with the profile of the panel 1.

[0016] The oscillation of the main roller 8 and of the glue feed means 7 may be performed in two different ways. In one (the first embodiment described below), both the elements are able to tilt and the glue feed means 7 are also able to move in such a way as to follow the profile of the panel 1.

[0017] With reference in particular to Figure 4, in a first embodiment in which the roller 6 is also used to apply glue to the edge 1b, the surface of the roller 6 is in contact with the glue feed means 7, the glue feed means 7 consisting basically of a glue pot 28 in a housing 29 made in the unit and located near the applicator roller 6. The glue pot 28 is equipped with a pair of spreader rollers 30 which turn freely about the corresponding vertical axes and are located between the glue pot 28 and the glue applicator roller 6 so that they can uniformly spread glue on the outer surface of the roller 6 which in turn applies it to the edge 1b of the panel 1.

[0018] In a second embodiment, illustrated schematically in Figure 17, in which the roller 6 is simply a contact roller for the edge 1b, there are glue feed means 100, again consisting of a glue pot 28' and a pair of spreader rollers 30' in contact with another roller 6' which applies glue to the surface of the edge band 4 in direction D. The roller 6' is located downstream of the contact roller 6 relative to the feed direction D of the edge band 4, whose other surface is guided by a guide element 40.

[0019] The guide element 40 (see Figure 17 again) consists of a blade 109 mounted on a rod 110 which is connected with a supporting structure 31 and which slides axially between an idle position, in which the blade 109 is away from the glue applicator roller 6' and a working position (shown in Figure 17) in which the blade 109 is close to the roller 6' and opposes the edge band 4. As described in more detail below, the guide element 40 can be used as such even in the embodiment where the roller 6 is also used to apply glue to the edge 1b.

[0020] For convenience, we will now describe the em-

bodiment where the roller 6 is used to apply glue to the edge 1b of the panel 1, although the structure of the unit described below is identical in both the embodiments mentioned above.

**[0021]** The first main pressure roller 8 of the edge band 4 is located downstream of the applicator roller 6 relative to the edge banding direction B, can turn freely about its vertical axis and is linked to a first connecting-rod 9 which is in turn pivoted to the shaft forming the main axis Z (see Figure 5 in particular).

**[0022]** The first connecting-rod 9 is connected to first means 10 for pressing the first roller 8 against the edge 1b and at the same time adjusting the angular position of the roller relative to the position of the glue applicator roller 6 in accordance with the profile of the edge 1b of the panel 1. In this way, the means 10 keep the first roller 8 pressed against the edge band 4 that has just been laid on the edge 1b.

**[0023]** Looking in more detail and with reference also to Figures 2, 3 and 5, the first pressure and adjusting means of the first main roller 8 consist of the first connecting-rod 9 pivoted to the shaft forming the main axis Z.

**[0024]** On the ends of the first connecting-rod 9, there is a pair of toothed wheels 19 and 20 around which a first chain 21 is looped. At one branch 21a of the chain 21, there are first drive means 22, connected to the first connecting-rod 9 and acting on the first branch in such a way as to allow the connecting-rod to turn in both directions (see arrows F in Figure 5) according to the profile of the edge 1b. In other words, the first drive means 22, consisting for example, of a linear actuator, are extended and retracted (see arrow F1 in Figure 5) in such a way as to cause the first connecting-rod 9 to turn since the toothed wheel 19 is keyed to the main shaft 5, that forms the main axis Z.

**[0025]** The main pressure roller 8 is connected to the first connecting-rod 9 by a central arm 18 which is attached at one end to the connecting-rod itself (or to a first upper guard 150 where the linear actuator 22 is also connected), which extends crossways with respect to the chain 21, and which, at its other end, mounts the main roller 8. The latter is therefore outside the working area of the first connecting-rod 9.

**[0026]** As shown in Figures 2 to 5, besides the first main roller 8, there is at least one secondary pressure roller 14 located downstream of the first main roller 8 relative to the edge banding direction B.

**[0027]** The second roller 14 is linked to a second connecting-rod 15 pivoted at one end to a first shaft 16, mounted on the first arm 18, which is coaxial with the first main roller 8 and which forms a pivot point G of the second roller 14.

**[0028]** There are also second means 17 for pressing on the second roller 14 and adjusting its position relative to the first roller 8 in accordance with the profile of the edge 1b of the panel 1, so that it remains in contact with the edge band 4 that has been applied.

**[0029]** Looking in more detail, the second pressing and adjustment means 17 consist of the second connecting-rod 15 having, on the ends of it, corresponding second toothed wheels 24 and 25 around which a second chain 26 is looped, the second toothed wheel 24 being securely keyed to the first shaft 16.

**[0030]** At the other toothed wheel 25, there are second means 27 for driving the second connecting-rod 15, the means 27 consisting, for example, of a rotary actuator acting on the toothed wheel 25 to turn the second roller 14 in both directions (see arrow F2 in Figure 5), relative to the position of the first roller 8, in accordance with the profile of the edge 1b and in such a way as to keep the second roller 14 in contact with the edge.

**[0031]** In short, structuring the two pressure rollers in this way provides two elements (both exerting pressure on the edge band but to different extents, the first roller more than the second) which are connected to each other in sequence and which are both able to rotate, the first about the pivot point Z and the second about the pivot point G, where the point G is the instantaneous position assumed by the first roller 8.

**[0032]** As also shown in Figures 14, 15 and 16, the first and second pressure rollers 8 and 14 (which are preferably made of steel) are mounted in such a way that they can turn freely on corresponding first and second shafts 101 and 105. The first shaft 101 is mounted at the free end of the central arm 18, while the second shaft 105 is mounted directly on the second connecting-rod 15.

**[0033]** On the ends of each of the two shafts 101 and 105 there are corresponding first and second rubber rings 102, 103 and 106, 107 connected to a single element 104, at the lower end, that supports each of the two units consisting of the shaft 101 or 105, the roller 8 or 14 and the rings 102, 103 or 106, 107.

**[0034]** In practice, the first and second shafts 101 and 105 are rigidly connected to each other at their lower ends by the single supporting element 104 that has, in turn, a vertical joining column 108 connected to the second connecting-rod 15.

**[0035]** The two pairs of rings 102, 103 and 106, 107 provide the corresponding rollers 8 and 14 with axial flexibility to enable the related shafts 101 and 105 and the corresponding rollers 8 and 14 to adjust to different shapes when they come into contact with the band 4 applied to the edge 1b.

**[0036]** Thanks to this flexibility, the two rollers easily adapt to the shape of the surface being pressed, compensating for imperfect assembling of the rollers or irregularities on the edge 1b of the panel 1 caused by previous machining. That means that each of the rollers 8 and 14 maintains a high specific thrust on the edge band 4 and, hence, allows good product quality to be achieved.

**[0037]** The numeral 11 in Figure 4 indicates means for feeding the edge band 4. The means 11 are located close to the roller 6 that applies glue to the edge 1b and

move together with the glue feed means 7.

[0038] The means 11 are made in such a way as to form a channel 12 through which the edge band 4, when required, is fed to the edge 1b in an area 13 between the applicator roller 6 and the two pressure rollers 8 and 14. Thus, the edge band 4 is placed in contact with the surface of the edge 1b and pressed by the rollers 8 and 14 to attach it permanently to the panel edge.

[0039] Looking in more detail, the feed means 11 comprise a supporting and covering structure 31 which houses a first pair of motor-driven rollers 32 for feeding the edge band 4 (which comes from a magazine that is not illustrated), the rollers being fitted opposite each other in such a way as to move the continuous edge band towards the edge 1b in the feed direction D.

[0040] Downstream of the pair of rollers 32, relative to the feed direction D, there are means 33 for detecting the passage of the edge band 4, operating on related stop means 34 located upstream of the pair of rollers 32, again relative to the feed direction D. The means 34 are designed to stop the feeding of the edge band 4 according to the position of the unit relative to the edge 1b.

[0041] The edge band 4 detecting means 33 may consist (see Figure 4 again) of at least one pair of optical units 35 placed opposite each other. The stop means 34 may consist of: a presser element 36 which, when activated, acts in a direction transversal to the feed direction D on a section of the edge band 4 being fed; and a straight wall 37 against which the presser element 36 presses the edge band 4 to stop it.

[0042] In addition to these elements, the supporting structure 31 also houses an arm 38 designed to guide the edge band 4 and located downstream of the detecting means 33 relative to the feed direction D. The guide arm 38 is positioned parallel to the edge band 4 and is pivoted at one end, at C, to the supporting structure 31.

[0043] The arm 38 has drive means 39 (which may consist of a cylinder, illustrated schematically as a block in Figure 4), the means 39 allowing the arm to rotate between two or, preferably, three positions: an idle position (shown by a continuous line in Figure 4) when no edge band 4 is detected and in which the arm 38 is close to the glue pot 28, and at least two working feed positions (of which one is clearly visible in Figures 6 to 13 and shown by dashed lines in Figure 4) in which the arm 38 is away from the glue pot 28, close to the guide element 40 and in contact with the edge band 4 in such a way as to keep the latter on a defined feed line which does not interfere with the glue applicator roller 6 limits the risk of the edge band springing back against the glue applicator roller 6. Obviously, the working angle of the arm 38 depends on the thickness of the edge band 4.

[0044] The numeral 41 indicates means for heating the edge band 4 located upstream of the stop means 34, relative to the feed direction D, and designed to make the edge band more pliable, especially when the edge banding being applied is quite thick.

[0045] The heating means 41 comprise one or more

short-wave infrared ray emitting units 42 positioned parallel to each other and transversal to the direction of feed D.

[0046] As mentioned above, the feed means 11 just described and the glue feed means 7 can tilt about the shaft that forms the main axis Z.

[0047] This angular adjustment is accomplished by means 110 (visible clearly in Figures 18 and 19) and partly in Figures 2 and 3) for adjusting the position of the means 11 and 7, that is, tilting the latter about the main axis Z according to the profile of the panel 1.

[0048] The adjustment means 110 consist of the above mentioned supporting and covering structure 31 of all the parts just described that form the means 11 for feeding the edge band 4 and the means 7 for feeding the glue, the structure 31 being free to turn about the main axis Z.

[0049] At the top of the supporting structure 31, there is a linear guide 111, that is slidably coupled to a counter-guide 112 made on a main mounting plate 113 that is rotatably connected to the shaft 5 forming the main axis Z.

[0050] The main mounting plate 113 comprises means 114 that drive it and, hence, also drive the supporting structure 31. The means 114 enable the plate 113 and the supporting structure 31 to tilt about the main axis Z in both directions (see arrow F110 in Figures 2, 3 and 18) thanks to the relative sliding of the guide 111 and the counter-guide 112.

[0051] The means 114 may consist of a cylinder 115 connected with the mounting plate 113 and whose stem 115s is connected to a fixed wall 116 in such a way that the stem can extend and retract in order to tilt the mounting plate 113 and the supporting structure 31 in accordance with the profile of the edge 1b of the panel 1.

[0052] Looking again at the above mentioned central arm 18, forming part of the first connecting-rod 9 and mounting the first roller 8, the arm 18 is equipped with means 43 that lock it in a fixed position in which the first main roller 8 is away from the edge 1b of the panel 1 when the glue applicator roller 6 comes into contact with the panel edge (see Figures 2, 15 and 16): this configuration is used, preferably during the initial stages of the edge banding operation to prevent the glue on the panel edge 1b from being smeared on the surface of the roller 8 and subsequently soiling the outer surface of the edge band 4.

[0053] The locking means 43 comprise a vertical pin 44 connected with the arm 18 and which can move along its vertical axis between a lowered, idle position in which the arm 18 is able to move, allowing the first main roller 8 to come into contact with the edge 1b, and a raised, working position (shown in Figure 2), in which the pin 44 is in contact with a wall 45 attached to a fixed structure 46 of the device (forming part of the shaft 5) in such a way as to determine said fixed position.

[0054] The fixed wall 45 has a set screw 47 that can be placed opposite the pin 44 in order to vary the posi-

tion in which the arm 18 stops relative to the set screw so as to adjust the distance between the first roller 8 and the edge 1b in the fixed position.

[0055] All the working parts described up to now are controlled and driven by a control unit 50, illustrated schematically as a block in Figure 2.

[0056] This unit may be a conventional, CNC system programmed according to the profile of the panel to be edge banded and acting on the device and on the work table 2.

[0057] As can be deduced from the above description, the edge banding device operates basically as follows starting from the configuration illustrated in Figure 4, that is to say, with the edge band 4 stopped inside the channel 12 by the locking means 34 and the arm 18 locked in the fixed position by the raising of the pin 44.

[0058] The unit is moved close to the edge 1b of the panel 1 until the edge 1b and the glue applicator roller 6 touch, while the means 50 adjust the position of the mounting plate 113 and the structure 31, acting also on the piston 115, in such a way as to put it in the position most suitable to apply the glue and feed the edge band 4 without interfering with the edge 1b. The unit starts moving in the application direction B, while the edge band 4 is fed towards the outfeed area 13 by the rollers 32. When the edge band 4 comes into contact with the edge 1b, the arm 18 is released by the lowering of the pin 44 and can start pressing on the edge band 4, together with the second roller 14, in order to join it to the edge 1b (see Figure 6).

[0059] This working configuration continues until the edge 1b right around the panel is covered, the unit even assuming "limit" positions as it follows the profile of the edge: Figures 7 to 9, for example, show the unit as it works on an edge with a profile that forms a right-angled concavity, and highlight the extreme flexibility of the components, especially the tilting (indicated by the arrows E) of the pressure rollers and of the glue and edge band 4 feed unit which allows them to automatically move to the most suitable working position according to the edge profile and without slowing down their operation.

[0060] Figures 10 to 13 show another working "limit" condition in which the unit disclosed can apply the edge band quickly and reliably, with top-quality results, thanks also to the double joint of the pressure rollers, shown clearly in Figure 13.

[0061] Without changing the structure of the components described until now, and as mentioned at the beginning of the present description, the glue feed means 7, incorporated in the edge band feed means 11, may be connected to the shaft which forms the main axis Z through suspension elements 200 designed to enable them to oscillate in a straight line with an irrotational movement in a plane and along two axes perpendicular to the main axis Z.

[0062] Looking in more detail (see Figures 20 and 21), the suspension elements 200 are located between the

main mounting plate 113, connected to the fixed structure of the device, and the covering structure 31 that houses the feed means 7 and the edge band feed means 11 (in these illustrations, the means 7 and 11 are not shown because they lie under the mounting plate 113/covering structure 31 assembly).

[0063] The suspension elements 200 consist of three separate pairs of connecting-rods 201, 202, 203 located between the mounting plate 113 and the covering structure 31 and linked to them at corresponding limit points. The three pairs of connecting-rods are also connected to each other at corresponding intermediate points by a rigid, substantially Y-shaped element 204: thanks to this configuration, the entire underlying unit can be moved in a plane instead of tilted as described above.

[0064] This particular movement requires means of controlling the position of the covering structure 31 relative to the profile of the edge 1b to be edge banded, that is to say, between the main mounting plate 113 and the covering structure 31, there may be means for controlling the position of the covering structure 31 relative to the main axis Z.

[0065] Said position control means may comprise a pair of cylinders 205 and 206 (the latter is only partly visible in Figure 21) fitted at right angles to each other and linked to the covering structure 31, at one end, while the relative stem is connected to a single vertical reference pin 207 connected to the covering structure 31. The vertical pin 207 is lined up with an opening 208 made in the main mounting plate 113 and on the other side of which there is an inductive sensor 209 (drawn with a dashed line), housed in the mounting plate 113. The sensor is designed to detect the presence of the pin 207 at the opening 208 and to stop the entire device if the pin 207 moves away from the opening 208. The moving away of the pin from the opening indicates that the covering structure 31 is in the wrong position relative to the edge 1b and leads to a program fault in the control unit 50.

[0066] The different way of tilting the covering structure 31 makes it possible to change the arrangement of the edge band 4 feed means 11 (along a 90° arc, which is a more compact arrangement than the one described above) but not the way they are made within the covering structure (as can be seen in Figures 22, 23, and 24).

[0067] An addition to the elements described above is illustrated in Figures 22 and 23, where a carriage 210 has been added to guide and carry the edge band 4 from the pair of feed rollers 32 to the proximity of the edge 1b at the start of the work cycle, that is, when the edge band starts being applied to the panel 1.

[0068] The carriage 210 has a fixed base 211 and a pair of arms 212 and 213 located opposite the base 211 in such a way as to form the continuation of the channel 12 for the passage of the edge band. Acting on the carriage 210 there is a cylinder 214 connected to the covering structure 31 and designed to drive the carriage 210 from a retracted, idle position (see Figure 22) to a for-

ward, working position in which it carries the edge band 4 close to the edge 1b (see Figure 23). The edge band 4 is carried at the same speed as that at which the rollers 32 feed it in direction D.

[0069] The stem of the cylinder 214 is connected to the end of the arm 212, which is L-shaped and pivoted at F212 to the body of the carriage 210 in such a way as to allow a portion of the edge band 4 to be rotated to a stop position in direction FC during the passage from the retracted to the forward position, under the thrusting action of the cylinder 214, and then to rotate the edge band 4 to a released position in the opposite direction FS when it is applied to the edge 1b. The release is effected by further moving forward only the carriage 210, with the stem fixed and acting this time as a centre of rotation.

[0070] Once the edge band 4 has been loaded, the carriage 210 returns to the retracted, idle position and stays there until the end of the working cycle on the current panel.

[0071] In another embodiment, illustrated in Figure 24, the edge band feed means 11 further comprise a feed arm 215 that applies glue to the edge band 4, this arm being equipped with a counter roller 216 at its free end and a cylinder 217 that drives it from an idle position, in which it is away from the glue applicator roller 6 and a working position (indicated by the arrow F215 in Figure 24), in which it is close to the glue applicator roller 6, with the edge band 4 (not illustrated in this case) between the roller 6 and the counter roller 216.

[0072] The loading of the edge band 4 may be effected again independently of the direction of rotation of the glue applicator roller 6 because the two rollers 32 that feed and load the edge band 4 have corresponding kinematic elements 218 which enable them to also rotate in the feed direction D in such a way as to feed the edge band but independently of the direction of rotation of the glue applicator roller 6.

[0073] The kinematic elements 218 (see Figures 21 and 27) consist of a pair of first toothed wheels 218a and 218b (drawn with dashed lines in Figure 21) keyed to a single rotating shaft 219 connected to the feed rollers 32 through a unit that transmits motion to all the means for feeding the edge band and the glue (not illustrated in this case). The two first toothed wheels 218a and 218b are housed at the top of the covering structure 31 and each of the two first toothed wheels 218a and 218b meshes with corresponding second toothed wheels 220 and 221 which are linked to the drive elements 222 of the device, are connected to the (motor-driven) shaft forming the main axis Z, and are driven in opposite directions of rotation.

[0074] In practice, the kinematic elements 222 comprise a drive wheel 222a on the shaft forming the main axis Z and meshed with a driven wheel 222b which enable drive to be transmitted to the two above mentioned second toothed wheels 220 and 221: one of the second toothed wheels, the one labelled 220, meshes directly

with one of the first toothed wheels, the one labelled 218a, while the other second toothed wheel, the one labelled 221, meshes with an idle wheel 221a which meshes with the first wheel 218b.

5 [0075] Each of the first toothed wheels 218a and 218b is equipped with free wheel means 218c designed to enable it to turn freely on the shaft 219 when the shaft forming the main axis Z turns in the direction opposite to its own.

10 [0076] The covering structure 31 also comprises means 223 for detecting the length of the edge band 4 and cutting off the edge band 4 when it has gone right around the panel to join the starting end 4a that was applied first.

15 [0077] As shown in Figures 24, 25 and 26, the detecting means 223 consist of a rod 224, which is pivoted at F224 to the covering structure 31 and which can rotate between an idle position (see Figure 25) in which it is withdrawn inside the covering structure 31, and a working position (accomplished by conventional drive means which are not illustrated), in which it protrudes from the structure (see arrow F224a in Figures 24 and 26) when necessary and is positioned close to the edge 1b, with a part in contact with the lower surface of the panel 1 to be edge banded.

20 [0078] The rod 224 is equipped with presence sensors 225 and 226 located opposite each other and designed to detect the starting end 4a of the edge band 4 (protruding from the edge 1b and thus blacking out the two sensors) and to send a signal to the control unit 50 which processes the signal and activates a cutoff unit 227, preferably located between the edge band 4 loading rollers 32 and the carriage 210, which cuts the edge band in a direction indicated by the arrow F227 in Figure 22 and thanks to a front stop 227s located on the channel 12.

25 [0079] The calculation for cutting the edge band 4 at the correct point is made on the basis of preset parameters programmed in the control unit 50.

30 [0080] The cutoff unit 227 (see Figure 28) consists of a circular cutter 228 mounted on a base 229 that is slidably connected to the covering structure 31 and linked to a cylinder 230 that drives it between a forward working position and a retracted, idle position (see arrow F228 in Figure 28).

35 [0081] Figure 29 shows the lower part of the glue feed means 7, that is, the part that controls the pair of glue spreader rollers 30 (not illustrated in Figure 29).

40 [0082] The two glue spreader rollers 30 are equipped with independent drive means 231 which open and close them in accordance with the direction of rotation of the glue applicator roller 6 and even according to where the glue is to be applied (on the panel edge 1b or on the edge band 4).

45 [0083] The drive means 231 consist of a vertical shaft 232 and 233 to connect each cylinder 30, each shaft 232, 233 being equipped with a rod 234, perpendicular to it and acted upon by cam means 235 which are in turn

acted upon by drive means 236 in such a way as to open one spreader roller 30 and close the other and vice versa (in the illustration, the shaft 232 has opened its spreader roller - see arrow F232 - while the shaft 233 is keeping its cylinder 30 in the closed position).

[0084] Between the two rods 234, there are spring means 237 designed to keep the rods apart so as to keep the corresponding spreader rollers 30 closed when the spreader rollers themselves and the drive cylinder 236 are in the idle position.

[0085] Looking in more detail, the above mentioned cam means 235 consist of a tubular carriage 238 within which the shafts 232, 233 can be housed, each shaft having a cam follower pin 239 placed in contact with the corresponding cam profiles 240 made on a wall of the carriage 238: this way, when the drive means 236 (consisting of a two-position pneumatic cylinder connected to the carriage 238) are moved in one direction or the other, one or other of the spreader rollers 30 is opened (see arrow F236 in Figure 29).

[0086] Figures 30 to 33 show the part of the device comprising the first and second pressure rollers 8 and 14 which press the edge band 4 on the panel 1.

[0087] From these illustrations it can be seen that the first pressure roller 8 can slide along the central supporting arm 18 so that its axis of rotation moves away from the main axis Z (see arrow FZ in Figure 31): this mechanism prevents the first roller 8 from jamming on the edge 1b of the panel 1 when it meets particularly sharp corners (for example at right angles) where the thrust applied by the first pressure means 10 to the roller 8 would risk breaking the roller if it were not free to slide.

[0088] The first roller 8 slides on a first guide 241 and, at the top of it, has a cam profile 242 that acts on a cam follower roller 243 connected to an element 244 used to regulate the pressure exerted by the first pressure means 10 so as to adjust the position of the first roller 8. The regulator 244 is designed to reduce the pressure of the roller 8 on the edge 1b (see arrow F244 in Figure 30) by releasing pressure from one chamber to the other of the cylinder forming the first drive means 22, as the roller moves away from the main axis Z on account of the force tending to jam it and created by the cam follower roller 243 moving back (see arrow F243).

[0089] Means 245 are envisaged to act on the first pressure means 10 so as to restore initial working conditions when the jamming force stops. These means may be constituted by the control unit 50 or by another cylinder 244c mounted in parallel with the cylinder 22 and always set to thrust conditions in parallel with the cylinder 22.

[0090] The above description of the first pressure roller 8 also applies to the second pressure roller 14, which slides along the central arm 18 so that its axis of rotation moves away from the main axis Z (see arrow F246 in Figures 32 and 33).

[0091] The second roller 14 slides on a second guide 246 made on the central arm 18 and, at the top of it, the

roller has a cam profile 247 that in turn acts on a cam follower roller 248 connected to regulator valve means 249 used to reduce the pressure exerted by the second pressure means 17 (that is, of the cylinder 27) acting on the second roller 14 in such a way as to reduce its pressure on the edge 1b.

[0092] When the force tending to jam the second roller 14 stops, the initial working conditions are restored by spring means 250 connected to the roller and to the central arm 18 (see arrow F250 in Figure 31).

[0093] The device as described above therefore achieves the aims of the invention by providing an extremely compact unit equipped with a reference roller which may be used either to apply glue to the panel edge or simply as a contact roller used to reference the panel. Working in conjunction with this roller, on each side of it, there are compact operating units which are flexibly positioned thanks to the possibility of oscillating either by tilting about the main reference axis or moving in a straight line and which are structured in such a way as to apply edge banding quickly and reliably, even to panels with profiles having extremely "difficult" shapes.

## 25 Claims

1. A device for applying edge banding to panels (1), especially panels which have differently shaped profiles and which can be worked on machines having at least one work table (2) on which the panel (1) is securely held, and application means (3) for gluing an edging band (4) to an edge (1b), the device comprising the application means (3) and the work table (2) being able to move relative to each other, said device being **characterized in that** the application means (3) for applying the edge band (4) consists of a unit with a motor-driven, shaft forming a vertical main axis (Z) and that mounts and drives at least the following items:

- a contact roller (6) for the edge (1b) of the panel (1), capable of rotating freely about its vertical axis, which coincides with the main axis (Z); - means (7) for feeding glue and at least one first main pressure roller (8), which presses on the edge band (4), said means (7) and pressure roller (8) located on opposite sides of the contact roller (6) and able to oscillate about the main axis (Z) in accordance with the profile of the panel (1).

2. The device according to claim 1, **characterized in that** the glue feed means (7) and the main pressure roller (8) are connected to the shaft forming the main axis (Z) in such a way that they can tilt about the axis (Z) so as to follow the profile of the panel (1).

3. The device according to claim 1, **characterized in**



that the glue feed means (7) are connected to the shaft forming the main axis (Z) in such a way that they can move in a straight line and thus follow the profile of the panel (1).

4. The device according to claim 3, **characterized in that** the glue feed means (7) are connected to the shaft which forms the main axis (Z) through suspension elements (200) designed to enable them to oscillate in a straight line with an irrotational movement in a plane and along two axes perpendicular to the main axis (Z).
5. The device according to claims 1 to 4, **characterized in that** the roller (6) is a roller that applies glue to the edge (1b) and is connected to the glue feed means (7) which spread glue on the roller (6).
6. The device according to claims 1 to 4, **characterized in that** the roller (6) is a contact roller for the edge (1b) and **in that** there are means (100) for applying glue directly to the edge band (4).
7. The device according to claim 1, **characterized in that** the first main pressure roller (8) of the edge band (4) is located downstream of the contact roller (6), relative to the direction (B) in which the edge band (4) is applied, can turn freely about its vertical axis and is linked to a first connecting-rod (9) which is in turn pivoted at one end to the shaft forming the main axis (Z); the first connecting-rod (9) being connected to first means (10) for pressing the first roller (8) against the edge (1b) and at the same time adjusting the angular position of the roller relative to the position of the contact roller (6) in accordance with the profile of the edge (1b) of the panel (1) and in such a way as to keep the first roller (8) pressed against the edge band (4).
8. The device according to claims 1 to 4, **characterized in that** it comprises means (11) for feeding the edge band (4) in the direction of the edge (1b) of the panel (1), located close to the contact roller (6) and able to oscillate, together with the glue feed means (7) about the main axis (Z) in accordance with the profile of the panel (1).
9. The device according to claims 1 to 5, **characterized in that** it comprises means (11) for feeding the edge band (4) in the direction of the edge (1b) of the panel (1), located close to the glue applicator roller (6) and able to oscillate, together with the glue feed means (7) about the main axis (Z) in accordance with the profile of the panel (1); said edge band (4) feed means (11) being made in such a way as to form a channel (12) through which the edge band (4), when required, is fed to the edge (1b) in an area (13) between the glue applicator roller (6) and the

first main pressure roller (8).

10. The device according to claim 1, **characterized in that** it comprises a secondary pressure roller (14) located downstream of the first, main roller (8) relative to a direction (B) in which the edge band (4) is applied and linked to a second connecting-rod (15) pivoted at one end to a first shaft (16) connected to the first central arm (18) mounting the first main roller (8) and forming a pivot point (G) of the second roller (14); there being second pressure means acting on the second roller (14) and used to adjust its position relative to the first roller (8) in accordance with the profile of the panel (1) so that it remains in contact with the edge band (4).
11. The device according to claim 7, **characterized in that** the means (10) for pressing and adjusting the position of the first roller (8) consist of the first connecting-rod (9) with a pair of toothed wheels (19, 20) at each end, of which one is securely keyed to the shaft that forms the main axis (Z); the toothed wheel (19, 20) having a first chain (21) looped around them; there being, at one branch (21a) of the chain (21), first drive means (22) connected to the first connecting-rod (9) and acting on the first branch in such a way as to allow the connecting-rod (9) to turn in both directions according to the profile of the edge (1b); said first connecting-rod (9) also having a central arm (18) extending transversally to the chain (21) and rotatably mounting at its free end the first main roller (8).
12. The device according to claim 10, **characterized in that** the second pressure and adjustment means (17) consist of a second connecting-rod (15) having, on the ends of it, corresponding second toothed wheels (24, 25) around which a second chain (26) is looped; the second toothed wheel (24) being securely keyed to the first shaft (16) and, at the other toothed wheel (25), there being second means (27) for driving the second connecting-rod (15), acting on the second chain (26) and designed to turn the second roller (14) relative to the position of the first roller (8) in both directions, in accordance with the profile of the edge (1b) and in such a way as to keep the second roller (14) in contact with the edge.
13. The device according to claims 1 to 5, **characterized in that** the glue feed means (7) consist of a glue pot (28) in a housing (29) made in the unit and located near the applicator roller (6); the glue pot (28) being equipped with a pair of spreader rollers (30) which turn freely about the corresponding vertical axes and located between the glue pot (28) and the glue applicator roller (6) so that they can uniformly spread glue on the outer surface of the roller (6).

14. The device according to claims 8 and 9, **characterized in that** the means (11) for feeding the edge band (4) comprise, within a supporting and covering structure (31), at least one pair of motor-driven rollers (32) used for loading the edge band (4) and fitted opposite each other in such a way as to move the continuous edge band (4) towards the edge (1b) in a feed direction (D); there being means (33) for detecting the passage of the edge band (4), located downstream of the pair of rollers (32) relative to the feed direction (D) and operating on related stop means (34) located upstream of the pair of rollers (32) relative to the feed direction (D) and designed to stop the feeding of the edge band (4) according to the position of the unit.
15. The device according to claim 14, **characterized in that** the means (33) for detecting the passage of the edge band (4) consist at least one pair of optical units (35) placed opposite each other.
16. The device according to claim 14, **characterized in that** the stop means (34) consist of a presser element (36) acting on a section of the edge band (4) being fed and a straight wall (37) against which the presser element (36) presses the edge band (4) to stop it.
17. The device according to claim 14, **characterized in that** the means (11) for feeding the edge band (4) comprise, downstream of the detecting means (33) relative to the feed direction (D), an arm (38) for guiding and spacing the edge band (4) from a glue applicator roller (6), positioned parallel to the edge band (4) and pivoted at one end, at (C), to the supporting structure (31); the arm (38) being equipped with drive means (39) designed to allow the arm to rotate at least between two limit positions, of which one is an idle position when no edge band (4) is detected and in which the arm (38) is away from a guide wall (40) of the edge band (4), and at least one working, feed position in which the arm (38) is close to the guide wall (40) and in contact with the edge band (4) being fed in such a way as to keep the latter on a defined feed line which does not interfere with the glue applicator roller (6).
18. The device according to claim 14, **characterized in that** the edge band (4) feed means (11) comprise means (41) for heating the edge band (4) located upstream of the stop means (34), relative to the feed direction (D), and designed to make the edge band more pliable when required.
19. The device according to claim 18, **characterized in that** the heating means (41) comprise one or more short-wave infrared ray emitting units (42) positioned parallel to each other and transversal to the direction of feed (D).
20. The device according to claim 11, **characterized in that** the central arm (18) is equipped with means (43) that lock it in a fixed position in which the first main roller (8) is away from the edge (1b) of the panel (1) when a contact roller (6) comes into contact with the panel edge.
21. The device according to claim 20, **characterized in that** the locking means (43) comprise a vertical pin (44) connected with the central arm (18) and which can move along its vertical axis between a lowered, idle position in which the central arm (18) is able to move, allowing the first main roller (8) to come into contact with the edge (1b), and a raised, working position in which the pin (44) is in contact with a wall (45) attached to a fixed structure (46) of the device in such a way as to determine said fixed position; the fixed wall (45) having a set screw (47) that can be placed opposite the pin (44) in order to vary the position in which the central arm (18) stops relative to the set screw so as to adjust the distance between the first roller (8) and the edge (1b) in the fixed position.
22. The device according to claim 7, **characterized in that** the first main pressure roller (8) of the edge band (4) is mounted in such a way that it can turn freely on a first shaft (101) mounted at the free end of the central arm (18) of the first connecting-rod (9); there being, on the ends of the shaft (101), corresponding first rubber rings (102, 103) designed to provide the first shaft (101) and the first roller (8) with axial flexibility so that they can adjust to different shapes when they come into contact with the band (4) applied to the edge (1b).
23. The device according to claim 10, **characterized in that** the second pressure roller (14) of the edge band (4) is mounted in such a way that it can turn freely on a second shaft (105) mounted on the second connecting-rod (15); there being, on the ends of the second shaft (105), corresponding second rubber rings (106, 107), said second rubber rings (106, 107) being designed to provide the second shaft (105) and the second roller (14) with axial flexibility so that they can adjust to different shapes when they come into contact with the band (4) applied to the edge (1b).
24. The device according to claims 22 and 23, **characterized in that** the first and second shafts (101, 105) of the corresponding first and second rollers (8, 14) are rigidly connected to each other at their lower ends by a single supporting element (104) having a vertical column (108) connected to the second connecting-rod (15).

25. The device according to claim 6, **characterized in that** it comprises a guide element (40), located close to the contact roller (6), said guide element (40) consisting of a blade (109) mounted on a rod (110) which slides axially between an idle position, in which the blade (109) is away from the contact roller (6) and a working position in which the blade (109) is close to the glue application means (100) and opposes the edge band (4), on the side opposite that on which the glue is applied.
26. The device according to claims 8 and 9, **characterized in that** the edge band (4) feed means (11) and the glue feed means (7) are equipped with means (110) for adjusting their position, that is to say, tilting them about the main axis (Z) according to the profile of the panel (1).
27. The device according to claim 26, **characterized in that** the adjustment means (110) consist of the a structure (31) that supports and covers the edge band feed means (11) and the glue feed means (7) and that is free to turn about the main axis (Z), the top of the structure (31) being equipped with a linear guide (111) that is slidably coupled to a counter-guide (112) made on a main mounting plate (113) that is rotatably connected to the shaft forming the main axis (Z); the main mounting plate (113) comprising means (114) that drive it and the supporting structure (31) and that are designed to enable the plate (113) and the supporting structure (31) to tilt about the main axis (Z) in both directions.
28. The device according to claims 1, 3 and 4, **characterized in that** the suspension elements (200) are located between the main mounting plate (113), connected to the shaft forming the main axis (Z), and a covering structure (31) that houses the feed means (7) and the edge band feed means (11).
29. The device according to claim 28, **characterized in that** the suspension means (200) consist of three separate pairs of connecting-rods (201, 202, 203) located between the mounting plate (113) and the covering structure (31) and linked to them at corresponding limit points; the connecting-rods (201, 202, 203) being also connected to each other at corresponding intermediate points by a rigid, substantially Y-shaped element (204).
30. The device according to claim 28, **characterized in that** it comprises means (205, 206) located between the main plate (113) and the covering structure (31) and used for controlling the position of the covering structure (31) relative to the main axis (Z), that is to say, relative to the profile of the edge (1b) of the panel (1).
31. The device according to claim 28, **characterized in that** the position control means consist of a pair of cylinders (205, 206) fitted at right angles to each other and linked to the covering structure (31), at one end, and to a single vertical reference pin (207) with the corresponding stem; the vertical pin (207) being lined up with an opening (208) made in the main plate (113) and on the other side of which there is an inductive sensor (209) housed in the plate (113) and designed to detect the presence of the pin (207) at the opening (208) and to stop the entire device when the pin (207) moves away from the opening (208) to indicate that the covering structure (31) is in the wrong position relative to the profile of the edge (1b).
32. The device according to claims 8 and 9, **characterized in that** the edge band feed means (11) comprise a carriage (210) designed to guide and carry the edge band (4) close to the edge (1b) at the start of the work cycle and equipped with a fixed base (211) and a pair of arms (212, 213) placed opposite the base (211) in such a way as to form a channel for the passage of the edge band; there being a cylinder (214) acting on the carriage (210), the cylinder (214) being connected to the covering structure (31) and designed to drive the carriage (210) from a retracted, idle position to a forward, working position in which it carries the edge band (4) close to the edge (1b).
33. The device according to claim 32, **characterized in that** the stem of the cylinder (214) is connected to the end of the arm (212), which is L-shaped and pivoted at (F212) to the body of the carriage (210) in such a way as to allow a portion of the edge band (4) to be rotated to a stop position during the passage from the retracted to the forward position, under the thrusting action of the cylinder (214), and then to rotate the edge band (4) to a released position in the opposite direction when it is applied to the edge (1b), said release being effected by further moving forward only the carriage (210) while keeping the stem fixed.
34. The device according to claims 8 and 9, **characterized in that** edge band feed means (11) comprise an arm (215) that applies glue to the edge band (4), this arm (215) being equipped with a counter roller (216) at its free end and a cylinder (217) that drives it from an idle position, in which it is away from the glue applicator roller (6) and a working position in which it is close to the glue applicator roller (6), with the edge band (4) between the roller (6) and the counter roller (216).
35. The device according to claims 8, 9 and 14, **characterized in that** the two rollers (32) that feed and

load the edge band (4) have corresponding kinematic elements (218) which enable them to rotate in the feed direction (D) independently of the direction of rotation of the glue applicator roller (6).

36. The device according to claims 14 and 35, **characterized in that** the kinematic elements (218) consist of a pair of first toothed wheels (218a, 218b) keyed to a single rotating shaft (219) connected to the feed rollers (32), said first toothed wheels (218a, 218b) being housed at the top of the covering structure (31) of the edge band feed means (11); each of the two first toothed wheels (218a, 218b) meshing with corresponding second toothed wheels (220, 221) which are linked to the drive elements (222) of the device, are connected to the shaft forming the main axis (Z), and are driven in opposite directions of rotation; each of the first toothed wheels (218a, 218b) being equipped with free wheel means (218c) designed to enable it to turn freely on the shaft (219) when the shaft forming the main axis (Z) turns in the direction opposite to its own.
37. The device according to claims 8 and 9, **characterized in that** the edge band feed means (11) comprise means (223) for detecting the length of the edge band (4) and cutting off the edge band (4) when it has gone right around the panel to join the starting end (4a) that was applied first.
38. The device according to claims 8, 9, 14 and 37, **characterized in that** the detecting means (223) consist of a rod (224) pivoted at (F224) to the covering structure (31) and designed to rotate between an idle position in which it is withdrawn inside the covering structure (31), and a working position in which it protrudes from the structure when necessary and is positioned close to the edge (1b), with a part in contact with the lower surface of the panel (1) to be edge banded; the rod (224) being equipped with presence sensors (225, 226) located opposite each other and designed to detect the starting end (4a) of the edge band (4) and to send a signal to the control unit (50) which processes the signal and activates a cutoff unit (227) located close to the channel (12) for the passage of the edge band (4).
39. The device according to claim 38, **characterized in that** the cutoff unit (227) consists of a circular cutter (228) mounted on a base (229) that is slidably connected to the covering structure (31) and linked to a drive cylinder (230).
40. The device according to claim 13, **characterized in that** the two glue spreader rollers (30) are equipped with independent drive means (231) to open and close them; the drive means (231) consisting of a vertical shaft (232, 233) to connect each cylinder

(30), each shaft (232, 233) being equipped with a rod (234), perpendicular to it and acted upon by cam means (235) which are in turn acted upon by drive means (236) in such a way as to open one spreader roller (30) and close the other and vice versa.

41. The device according to claim 40, **characterized in that** the two rods (234) have spring means (237) designed to keep them apart so as to keep the corresponding spreader rollers (30) closed when the drive means (236) are in the idle position.
42. The device according to claim 40, **characterized in that** the cam means (235) consist of a tubular carriage (238) within which the shafts (232, 233) can be partly housed, each shaft having a cam follower pin (239) placed in contact with the corresponding cam profiles (240) made on a wall of the carriage (238) so that, when the drive means (236), consisting of a pneumatic cylinder connected to the carriage (238) are activated, one or other of the spreader rollers (30) is opened.
43. The device according to claim 11, **characterized in that** the first pressure roller (8) can slide along the central supporting arm (18) so that its axis of rotation moves away from the main axis (Z) in order to prevent said first roller from jamming on the edge (1b) of the panel (1).
44. The device according to claims 11 and 43, **characterized in that** the first roller (8) slides on a first guide (241) and, at the top of it, has a cam profile (242) that acts on a cam follower roller (243) connected to an element (244) used to regulate the pressure exerted by the first pressure means (10) so as to adjust the position of the first roller (8) and to reduce the pressure of the first roller (8) on the edge (1b) when the roller moves away from the main axis (Z); means (245) being envisaged to act on the first pressure means (10) so as to restore initial working conditions.
45. The device according to claim 12, **characterized in that** the second pressure roller (14) slides along the central arm (18) so that its axis of rotation moves away from the main axis (Z) and the first pressure roller (8) in order to prevent said second roller from jamming on the edge (1b) of the panel (1).
46. The device according to claim 45, **characterized in that** the second roller (14) slides on a second guide (246) located on the central arm (18) and, at the top of it, has a cam profile (247) that acts on a cam follower roller (248) connected to regulator valve means (249) used to reduce the pressure exerted by second pressure means (17) acting on the second roller (14) in such a way as to reduce its pres-

sure on the edge (1b); spring means (250) acting between the second roller (14) and the central arm (18) in order to restore initial working conditions.

#### Patentansprüche

1. Vorrichtung zum Anbringen von Umleimern an Platten (1), insbesondere an Platten, welche unterschiedlich geformte Profile haben, und welche auf Maschinen verarbeitet werden können, die wenigstens einen Arbeitstisch (2) aufweisen, auf welchem die Platte (1) festgehalten wird, sowie Anbringungsmittel (3) zum Verkleben eines Umleimers (4) an einer Kante (1b), wobei die Vorrichtung die Anbringungsmittel (3) und den Arbeitstisch (2) enthält, die in der Lage sind, sich im Verhältnis zueinander zu bewegen, wobei die genannte Vorrichtung **dadurch gekennzeichnet ist, dass** die Anbringungsmittel (3) zum Anbringen des Umleimers (4) aus einer Einheit mit einer angetriebenen Welle bestehen, welche eine vertikale Hauptachse (Z) bildet und die folgenden Elemente trägt und antreibt:
  - eine Kontaktrolle (6) für die Kante (1b) der Platte (1), die sich frei um ihre vertikale Achse drehen kann, welche mit der Hauptachse (Z) übereinstimmt;
  - Mittel (7) zum Zuführen von Kleber; und
  - wenigstens eine erste Hauptpressrolle (8), welche auf den Umleimer (4) drückt, wobei die genannten Mittel (7) und die Pressrolle (8) auf entgegengesetzten Seiten der Kontaktrolle (6) angeordnet und in der Lage sind, übereinstimmend mit dem Profil der Platte (1) um die Hauptachse (Z) zu schwingen.
2. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** die Zuführmittel (7) für den Kleber und die Hauptpressrolle (8) mit der die Hauptachse (Z) bildenden Welle auf solche Weise verbunden sind, dass sie um die Achse (Z) schwenken können, um so dem Profil der Platte (1) zu folgen.
3. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** die Zuführmittel (7) für den Kleber mit der die Hauptachse (Z) bildenden Welle auf solche Weise verbunden sind, dass sie sich in einer geraden Linie bewegen und somit dem Profil der Platte (1) folgen können.
4. Vorrichtung nach Patentanspruch 3, **dadurch gekennzeichnet, dass** die Zuführmittel (7) für den Kleber mit der die Hauptachse (Z) bildenden Welle durch Aufhängeelemente (200) verbunden sind, bestimmt sie zu befähigen, in einer geraden Linie zu schwingen, und zwar mit einer wirbelfreien Be-

wegung auf einer Ebene und entlang von zwei lotrecht zu der Hauptachse (Z) verlaufenden Achsen.

5. Vorrichtung nach den Patentansprüchen von 1 bis 4, **dadurch gekennzeichnet, dass** die Rolle (6) eine Rolle ist, welche den Kleber auf die Kante (1b) aufträgt, und die an die Zuführmittel (7) für den Kleber angeschlossen ist, welche den Kleber auf die Rolle (6) streichen.
6. Vorrichtung nach den Patentansprüchen von 1 bis 4, **dadurch gekennzeichnet, dass** die Rolle (6) eine Kontaktrolle für die Kante (1b) ist, und dass Mittel (100) zum Auftragen des Klebers direkt auf den Umleimer (4) vorhanden sind.
7. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** die erste Hauptpressrolle (8) für den Umleimer (4) stromabwärts der Kontaktrolle (6) im Verhältnis zu der Richtung (B), in welcher der Umleimer (4) angebracht wird, angeordnet ist, sich frei um ihre vertikale Achse drehen kann und an eine erste Pleuelstange (9) angeschlossen ist, welche wiederum mit einem Ende an die Hauptachse (Z) bildende Welle angelenkt ist; wobei die erste Pleuelstange (9) an erste Mittel (10) zum Pressen der ersten Rolle (8) gegen die Kante (1b) und gleichzeitig zum Einstellen der Winkelposition der Rolle im Verhältnis zu der Position der Kontaktrolle (6) angeschlossen ist, und zwar je nach dem Profil der Kante (1b) der Platte (1) und auf solche Weise, dass die erste Rolle (8) gegen den Umleimer (4) gedrückt gehalten wird.
8. Vorrichtung nach den Patentansprüchen von 1 bis 4, **dadurch gekennzeichnet, dass** sie Mittel (11) zum Zuführen des Umleimers (4) in Richtung der Kante (1b) der Platte (1) enthält, die dicht an der Kontaktrolle (6) angeordnet und in der Lage sind, zusammen mit den Zuführmitteln (7) für den Kleber um die Hauptachse (Z) zu schwingen, je nach dem Profil der Platte (1).
9. Vorrichtung nach den Patentansprüchen von 1 bis 5, **dadurch gekennzeichnet, dass** sie Mittel (11) zum Zuführen des Umleimers (4) in Richtung der Kante (1b) der Platte (1) enthält, die dicht an der Auftragerolle (6) des Klebers angeordnet und in der Lage sind, zusammen mit den Zuführmitteln (7) für den Kleber um die Hauptachse (Z) zu schwingen, je nach dem Profil der Platte (1); wobei die genannten Zuführmittel (11) des Umleimers (4) auf solche Weise ausgelegt sind, dass sie einen Kanal (12) bilden, durch welchen der Umleimer (4), wenn erforderlich, der Kante (1b) in einem Bereich (13) zugeführt wird, der sich zwischen der Auftragerolle (6) des Klebers und der ersten Hauptpressrolle (8) befindet.

10. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** sie eine sekundäre Pressrolle (14) enthält, angeordnet stromabwärts der ersten Hauptrolle (8) im Verhältnis zu der Richtung (B), in welcher der Umleimer (4) angebracht wird, und angeschlossen an eine zweite Pleuelstange (15), die mit einem Ende an eine erste Welle (16) angelenkt ist, letztere an den ersten mittleren Arm (18) angeschlossen, der die erste Hauptrolle (8) trägt und einen Drehpunkt (G) der zweiten Rolle (14) bildet; wobei zweite Pressmittel vorhanden sind, die auf die zweite Rolle (14) wirken und dazu benutzt werden, deren Position im Verhältnis zu der ersten Rolle (8) je nach dem Profil der Platte (1) zu regulieren, so dass sie im Kontakt mit dem Umleimer (4) bleibt.
11. Vorrichtung nach Patentanspruch 7, **dadurch gekennzeichnet, dass** die Mittel (10) zum Pressen und Regulieren der Position der ersten Rolle (8) aus der ersten Pleuelstange (9) bestehen, versehen an jedem Ende mit einem Paar von Zahnrädern (19, 20), von denen eins fest auf die Welle aufgezogen ist, welche die Hauptachse (Z) bildet; wobei um die Zahnräder (19, 20) eine erste, ringförmig geschlossene Kette (21) gewunden ist; wobei an einem Abschnitt (21a) der Kette (21) erste Antriebsmittel (22) vorhanden sind, angeschlossen an die erste Pleuelstange (9) und auf den ersten Abschnitt auf solche Weise wirkend, dass sich die Pleuelstange (9) in beiden Richtungen je nach dem Profil der Kante (1b) drehen kann; wobei die genannte erste Pleuelstange (9) ebenfalls einen mittleren Arm (18) aufweist, der sich quer zu der Kette (21) erstreckt und an seinem freien Ende drehbar die erste Hauptrolle (8) trägt.
12. Vorrichtung nach Patentanspruch 10, **dadurch gekennzeichnet, dass** die zweiten Press- und Reguliermittel (17) aus einer zweiten Pleuelstange (15) bestehen, die an ihren Enden entsprechende zweite Zahnräder (24, 25) hat, um welche eine zweite Kette (26) gewunden ist; wobei das zweite Zahnrad (24) fest auf die erste Welle (16) aufgezogen ist und an dem anderen Zahnrad (25) zweite Mittel (27) für den Antrieb der zweiten Pleuelstange (15) vorhanden sind, die auf die zweite Kette (26) wirken und dazu dienen, die zweite Rolle (14) im Verhältnis zu der Position der ersten Rolle (8) in beiden Richtungen zu drehen, je nach dem Profil der Kante (1b) und auf solche Weise, dass die Rolle (14) im Kontakt mit der Kante gehalten wird.
13. Vorrichtung nach den Patentansprüchen von 1 bis 5, **dadurch gekennzeichnet, dass** die Zuführmittel (7) für den Kleber aus einem Kleberbehälter (28) besteht, angeordnet in einem Sitz (29), welcher in die Einheit eingearbeitet ist und sich dicht an der Auftragerolle (6) befindet; wobei der Kleberbehälter (28) mit einem Paar von Streichrollen (30) ausgestattet ist, welche sich frei um die entsprechenden vertikalen Achsen drehen und zwischen dem Kleberbehälter (28) und der Auftragerolle (6) des Klebers angeordnet sind, so dass sie den Kleber gleichmässig auf die äussere Oberfläche der Rolle (6) streichen können.
14. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet, dass** die Mittel (11) zum Zuführen des Umleimers (4) innerhalb einer Träger- und Abdeckstruktur (31) wenigstens ein Paar von angetriebenen Rollen (32) enthalten, benutzt zum Laden des Umleimers (4) und sich gegenüberliegend auf solche Weise angebracht, dass sie den kontinuierlichen Umleimer (4) in einer Zuführrichtung (D) zu der Kante (1b) leiten; wobei Mittel (33) zum Erfassen des Durchlaufs des Umleimers (4) vorhanden sind, angeordnet stromabwärts von dem Paar von Rollen (32) im Verhältnis zu der Zuführrichtung (D) und auf entsprechende Arretiermittel (34) wirkend, die sich im Verhältnis zu der Zuführrichtung (D) stromaufwärts des Paares von Rollen (32) befinden und dazu bestimmt sind, das Zuführen des Umleimers (4) je nach der Position der Einheit zu stoppen.
15. Vorrichtung nach Patentanspruch 14, **dadurch gekennzeichnet, dass** die Mittel (33) zum Erfassen des Durchlaufs des Umleimers (4) aus wenigstens einem Paar von optischen Vorrichtungen (35) bestehen, die sich gegenüberliegend angeordnet sind.
16. Vorrichtung nach Patentanspruch 14, **dadurch gekennzeichnet, dass** die Arretiermittel (34) aus einem Presselement (36) bestehen, welches auf einen Abschnitt des vorlaufenden Umleimers (4) wirkt, und aus einer geraden Wand (37), gegen welche das Presselement (36) den Umleimer (4) drückt, um ihn anzuhalten.
17. Vorrichtung nach Patentanspruch 14, **dadurch gekennzeichnet, dass** die Mittel (11) zum Zuführen des Umleimers (4) stromabwärts der Erfassungsmittel (33) im Verhältnis zu der Zuführrichtung (D) einen Arm (38) enthalten, der zum Führen des Umleimers (4) und zum Halten desselben auf Abstand von einer Auftragerolle (6) des Klebers dient, positioniert parallel zu dem Umleimer (4) und angelenkt mit einem Ende in (C) an die Trägerstruktur (31); wobei der Arm (38) mit Antriebsmitteln (39) versehen ist, die es dem Arm erlauben, sich wenigstens zwischen zwei Grenzpositionen zu drehen, von welchen eine die Ruhestellung ist, wenn kein Umleimer (4) erfasst und in welcher der Arm (38) von einer Führungswand (40) des Umleimers (4) entfernt ist, und wenigstens eine Arbeits- oder Zuführposition,

- in welcher der Arm (38) dicht an der Führungswand (40) liegt und auf solche Weise im Kontakt mit dem vorlaufenden Umleimer (4) ist, dass letzterer auf einer bestimmten Vorlaufbahn gehalten wird, welche nicht die Auftragerolle (6) des Klebers behindert. 5
18. Vorrichtung nach Patentanspruch 14, **dadurch gekennzeichnet, dass** die Zuführmittel (11) des Umleimers (4) Mittel (41) zum Erwärmen des Umleimers (4) enthalten, die im Verhältnis zu der Zuführ- 10 richtung (D) stromaufwärts der Arretiemittel (34) angeordnet und dazu bestimmt sind, den Umleimer, falls erforderlich, geschmiediger zu machen.
19. Vorrichtung nach Patentanspruch 18, **dadurch gekennzeichnet, dass** die Heizmittel (41) eine oder 15 mehr Emissionseinheiten (42) von Kurzwellen-Infrarotstrahlen enthalten, die parallel zueinander und quer zu der Zuführrichtung (D) angeordnet sind. 20
20. Vorrichtung nach Patentanspruch 11, **dadurch gekennzeichnet, dass** der mittlere Arm (18) mit Mit- 25 teln (43) versehen ist, die ihn in einer festen Position blockieren, in welcher die erste Hauptrolle (8) von der Kante (1b) der Platte (1) entfernt ist, wenn eine Kontaktrolle (6) mit der Plattenkante in Kontakt kommt.
21. Vorrichtung nach Patentanspruch 20, **dadurch gekennzeichnet, dass** die Blockiermittel (43) einen 30 vertikalen Zapfen (44) enthalten, der mit dem mittleren Arm (18) verbunden ist und sich entlang seiner vertikalen Achse verschieben kann, und zwar zwischen einer unteren Ruhestellung, in welcher sich der mittlere Arm (18) bewegen kann und es der 35 ersten Hauptrolle (8) erlaubt, mit der Kante (1b) in Kontakt zu kommen, und einer angehobenen Arbeitsposition, in welcher sich der Zapfen (44) im Kontakt mit einer Wand (45) befindet, die an einer festen Struktur (46) der Vorrichtung auf solche Weise angebracht ist, dass die genannte feststehende Posi- 40 tion bestimmt wird; wobei die feststehende Wand (45) eine Stellschraube (47) aufweist, die gegenüber dem Zapfen (44) eingesetzt werden kann, um die Position zu verändern, in welcher der mittlere Arm (18) im Verhältnis zu der Stellschraube ans- 45 schlägt, so dass der Abstand zwischen der ersten Rolle (8) und der Kante (1b) in der festen Position reguliert werden kann. 50
22. Vorrichtung nach Patentanspruch 7, **dadurch gekennzeichnet, dass** die erste Hauptpressrolle (8) des Umleimers (4) auf solche Weise montiert ist, 55 dass sie sich frei auf einer ersten Welle (101) drehen kann, die an dem freien Ende des mittleren Arms (18) der ersten Pleuelstange (9) angebracht ist; wobei an den Enden der Welle (101) entspre- chende erste Gummiringe (102, 103) vorhanden sind, dazu bestimmt, die erste Welle (101) und die erste Rolle (8) mit einer Flexibilität zu versehen, so dass sie sich den verschiedenen Formen anpassen können, wenn sie in Kontakt mit dem an der Kante (1b) angebrachten Umleimer (4) kommen.
23. Vorrichtung nach Patentanspruch 10, **dadurch gekennzeichnet, dass** die zweite Pressrolle (14) des Umleimers (4) auf solche Weise montiert ist, dass sie sich frei auf einer zweiten Welle (105) drehen kann, die an der zweiten Pleuelstange (15) ange- 10 bracht ist; wobei an den Enden der zweiten Welle (105) entsprechende zweite Gummiringe (106, 107) vorhanden sind, wobei die genannten zweiten Gummiringe (106, 107) dazu bestimmt sind, die 15 zweite Welle (105) und die zweite Rolle (14) mit einer Flexibilität zu versehen, so dass sie sich den verschiedenen Formen anpassen können, wenn sie in Kontakt mit dem an der Kante (1b) angebrachten Umleimer (4) kommen.
24. Vorrichtung nach den Patentansprüchen 22 und 23, **dadurch gekennzeichnet, dass** die ersten und 25 zweiten Wellen (101, 105) der entsprechenden ersten und zweiten Rollen (8, 14) an ihren unteren Enden starr miteinander verbunden sind, und zwar durch ein einziges Trägerelement (104) mit einer vertikalen Säule (108), die an die zweite Pleuelstan- 30 ge (15) angeschlossen ist.
25. Vorrichtung nach Patentanspruch 6, **dadurch gekennzeichnet, dass** sie ein Führungselement (40) enthält, angeordnet dicht an der Kontaktrolle (6), 35 wobei das genannte Führungselement (40) aus einem an einer Stange (110) montierten Blatt (109) besteht, welches axial zwischen einer Ruhestellung, in welcher das Blatt (109) von der Kontaktrolle (6) entfernt ist, und einer Arbeitsposition gleitet, in 40 welcher das Blatt (109) dicht an den Auftragemitteln (100) des Klebers liegt und dem Umleimer (4) auf der entgegengesetzten Seite von der, auf welche der Kleber aufgetragen ist, entgegen wirkt.
26. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet, dass** die Zuführmittel 45 (11) des Umleimers (4) und die Zuführmittel (7) des Klebers mit Mitteln (110) zum Regulieren ihrer Position versehen sind, das heisst zum Schwenken derselben um die Hauptachse (Z) je nach dem Profil der Platte (1). 50
27. Vorrichtung nach Patentanspruch 26, **dadurch gekennzeichnet, dass** die Reguliermittel (110) aus 55 einer Struktur (31) bestehen, welche die Zuführmittel (11) des Umleimers und die Zuführmittel (7) des Klebers trägt und abdeckt, und dass sie frei ist, sich um die Hauptachse (Z) zu drehen, wobei der obere

- Teil der Struktur (31) mit einer linearen Führung (111) versehen ist, gleitbar verbunden mit einer Gegenführung (112) an einer Hauptmontageplatte (113), welche drehbar mit der die Hauptachse (Z) bildenden Welle verbunden ist; wobei die Hauptmontageplatte (113) Mittel (114) enthält, welche diese und die genannte Trägerstruktur (31) betätigen, und die dazu bestimmt sind, das Schwenken der Platte (113) und der Trägerstruktur (31) um die Hauptachse (Z) in beiden Richtungen zu erlauben.
28. Vorrichtung nach den Patentansprüchen 1, 3 und 4, **dadurch gekennzeichnet**, dass die Aufhängeelemente (200) zwischen der Hauptmontageplatte (113), die mit der die Hauptachse (Z) bildenden Welle verbunden ist, und einer Abdeckstruktur (31), welche die Zuführrmittel (7) und die Zuführrmittel (11) des Umleimers aufnimmt, angeordnet sind.
29. Vorrichtung nach Patentanspruch 28, **dadurch gekennzeichnet**, dass die Aufhängeelemente (200) aus drei getrennten Paaren von Pleuelstangen (201, 202, 203) bestehen, angeordnet zwischen der Montageplatte (113) und der Abdeckstruktur (31) und an diese an entsprechenden Grenzpunkten angeschlossen; wobei die Pleuelstangen (201, 202, 203) ebenfalls an entsprechenden Zwischenpunkten durch ein starres, im wesentlichen Y-förmiges Element (204) miteinander verbunden sind.
30. Vorrichtung nach Patentanspruch 28, **dadurch gekennzeichnet**, dass sie Mittel (205, 206) enthält, angeordnet zwischen der Hauptplatte (113) und der Abdeckstruktur (31) und benutzt zum Steuern der Position der Abdeckstruktur (31) im Verhältnis zu der Hauptachse (Z), das heisst im Verhältnis zu dem Profil der Kante (1b) der Platte (1).
31. Vorrichtung nach Patentanspruch 28, **dadurch gekennzeichnet**, dass die Mittel zum Steuern der Position aus einem Paar von Zylindern (205, 206) bestehen, angeordnet im rechten Winkel zueinander und an der Abdeckstruktur (31) an einem Ende mit dem entsprechenden Schaft an einem einzigen vertikalen Bezugzapfen (207) befestigt; wobei der vertikale Zapfen (207) zu einer Öffnung (208) ausgerichtet ist, die sich in der Hauptplatte (113) befindet, und auf deren anderer Seite ein induktiver Fühler (209) vorhanden ist, aufgenommen in der Platte (113) und dazu bestimmt, das Vorhandensein des Zapfens (207) an der Öffnung (208) zu erfassen und die gesamte Vorrichtung anzuhalten, wenn sich der Zapfen (207) von der Öffnung (208) fort bewegt, um anzuzeigen, dass sich die Abdeckstruktur (31) in der falschen Position im Verhältnis zu dem Profil der Kante (1b) befindet.
32. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet**, dass die Zuführrmittel (11) für den Umleimer einen Schlitten (210) enthalten, dazu bestimmt, den Umleimer (4) bei Beginn des Arbeitszyklus dicht an der Kante (1b) zu führen und zu halten, und der mit einer feststehenden Basis (211) und einem Paar von Armen (212, 213) versehen ist, die auf solche Weise der Basis (211) gegenüberliegend angeordnet sind, dass ein Kanal für den Durchlass des Umleimers gebildet wird; wobei ein auf den Schlitten (210) wirkender Zylinder (214) vorhanden ist, und wobei der Zylinder (214) an die Abdeckstruktur (31) angeschlossen und dazu bestimmt ist, den Schlitten (210) aus einer zurückgezogenen Ruhestellung in eine vorgeschobene Arbeitsposition zu verschieben, in welcher er den Umleimer (4) dicht an die Kante (1b) führt.
33. Vorrichtung nach Patentanspruch 32, **dadurch gekennzeichnet**, dass der Schaft des Zylinders (214) an das Ende des Armes (212) angeschlossen ist, welcher L-förmig ausgebildet und in (F212) an den Körper des Schlittens (210) angelenkt ist, und zwar auf solche Weise, dass ein Abschnitt des Umleimers (4) während des Übergangs aus der zurückgezogenen Position in die vorgeschobene Position und unter der Schubwirkung des Zylinders (214) in eine Blockierposition gedreht werden kann, und dann der Umleimer (4) in der entgegengesetzten Richtung in eine Freigabeposition gedreht werden kann, wenn er an der Kante (1b) angebracht ist, wobei die genannte Freigabe durch eine weitere Vorwärtsbewegung nur des Schlittens (210) erfolgt, während der Schaft festgehalten wird.
34. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet**, dass die Zuführrmittel (11) für den Umleimer einen Arm (215) enthalten, welcher den Kleber auf den Umleimer (4) aufträgt, wobei dieser Arm (215) mit einer Gegenrolle (216) an seinem freien Ende und mit einem Zylinder (217) versehen ist, der ihn aus einer Ruhestellung, in welcher er von der Auftragerolle (6) des Klebers entfernt ist, in eine Arbeitsposition, in welcher er dicht an der Auftragerolle (6) des Klebers ist, bewegt, und zwar mit dem Umleimer (4) zwischen der Rolle (6) und der Gegenrolle (216).
35. Vorrichtung nach den Patentansprüchen 8, 9 und 14, **dadurch gekennzeichnet**, dass die beiden Rollen (32), welche den Umleimer (4) zuführen und laden, entsprechende kinematische Elemente (218) aufweisen, welche sie befähigen, sich in der Zuführrichtung (D) unabhängig von der Drehrichtung der Auftragerolle (6) des Klebers zu drehen.
36. Vorrichtung nach den Patentansprüchen 14 und 35, **dadurch gekennzeichnet**, dass die kinematischen Elemente (218) aus einem Paar von ersten



- Zahnradern (218a, 218b) bestehen, aufgezogen auf eine einzige drehende Welle (219), die an die Zuführrollen (32) angeschlossen ist, wobei die genannten ersten Zahnradern (218a, 218b) im oberen Teil der Abdeckstruktur (31) der Zuführmittel (11) für den Umleimer angeordnet sind; wobei jedes der beiden ersten Zahnradern (218a, 218b) in entsprechende zweite Zahnradern (220, 221) greift, welche an die Antriebs Elemente (222) der Vorrichtung angeschlossen und mit der die Hauptachse (Z) bildenden Welle verbunden sind, und die in entgegengesetzten Drehrichtungen in Umdrehung versetzt werden; wobei jedes der ersten Zahnradern (218a, 218b) mit Freilaufmitteln (218c) ausgestattet ist, die es befähigen, sich frei auf der Welle (219) zu drehen, wenn die die Hauptachse (Z) bildende Welle sich in entgegengesetzter Richtung zu ihrer eigenen dreht.
37. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet, dass** die Zuführmittel (11) für den Umleimer Mittel (223) zum Erfassen der Länge des Umleimers (4) enthalten und den Umleimer (4) abschneiden, wenn dieser um die Platte herum geführt worden ist und das Anfangsstück (4a) erreicht hat, das zuerst angebracht worden ist.
38. Vorrichtung nach den Patentansprüchen 8, 9, 14 und 37, **dadurch gekennzeichnet, dass** die Erfassungsmittel (223) aus einer Leiste (224) bestehen, angelenkt in (F224) an die Abdeckstruktur (31) und dazu bestimmt, sich zwischen einer Ruhestellung, in welcher sie in die Abdeckstruktur (31) hineingezogen ist, und einer Arbeitsposition zu drehen, in welcher sie, wenn erforderlich, aus der Struktur herausragt und dicht an der Kante (1b) angeordnet ist, und zwar mit einem Teil im Kontakt mit der unteren Oberfläche der zu umleimenden Platte (1); wobei die Leiste (224) mit Abtastfühlern (225, 226) versehen ist, die einander gegenüberliegend angeordnet und dazu bestimmt sind, das Anfangsstück (4a) des Umleimers (4) zu erfassen und ein Signal an die Steuereinheit (50) auszusenden, welche das Signal verarbeitet und eine Schneideinheit (227) aktiviert, die dicht an dem Kanal (12) für den Durchlauf des Umleimers (4) angeordnet ist.
39. Vorrichtung nach Patentanspruch 38, **dadurch gekennzeichnet, dass** die Schneideinheit (227) aus einem kreisförmigen Messer (228) besteht, montiert an einer Basis (229), die gleitbar mit der Abdeckstruktur (31) verbunden und an einen Antriebszylinder (230) angeschlossen ist.
40. Vorrichtung nach Patentanspruch 13, **dadurch gekennzeichnet, dass** die Streichrollen (30) für den Kleber mit unabhängigen Antriebsmitteln (231) zum Öffnen und Schliessen derselben versehen sind; wobei die Antriebsmittel (231) aus einer vertikalen Welle (232, 233) zum Anschliessen jeder Rolle (30) bestehen, und wobei jede Welle (232, 233) mit einer Stange (234) versehen ist, lotrecht angeordnet und durch Nockenmittel (235) auf diese wirkend, welche wiederum durch Antriebsmittel (236) auf solche Weise ausgelöst werden, dass eine Streichrolle (30) geöffnet und die andere geschlossen wird und umgekehrt.
41. Vorrichtung nach Patentanspruch 40, **dadurch gekennzeichnet, dass** die beiden Stangen (234) Federmittel (237) enthalten, die dazu bestimmt sind, sie auseinander zu halten, so dass die entsprechenden Streichrollen (30) geschlossen gehalten werden, wenn sich die Antriebsmittel (236) in der Ruhestellung befinden.
42. Vorrichtung nach Patentanspruch 40, **dadurch gekennzeichnet, dass** die Nockenmittel (235) aus einem rohrförmigen Schlitten (238) bestehen, in welchem die Wellen (232, 233) teilweise aufgenommen sind, wobei jede Welle einen Nockenstößelzapfen (239) enthält, im Kontakt mit den entsprechenden Nockenprofilen (240) angeordnet, die in eine Wand des Schlittens (238) eingearbeitet sind, so dass, wenn die aus einem an den Schlitten (238) angeschlossenen Druckluftzylinder bestehenden Antriebsmittel (236) aktiviert sind, die eine oder die andere der Streichrollen (30) geöffnet wird.
43. Vorrichtung nach Patentanspruch 11, **dadurch gekennzeichnet, dass** die erste Pressrolle (8) entlang dem mittleren Tragarm (18) gleiten kann, so dass sich ihre Drehachse von der Hauptachse (Z) fort bewegt, um die genannte erste Rolle daran zu hindern, sich an der Kante (1b) der Platte (1) zu verklemmen.
44. Vorrichtung nach den Patentansprüchen 11 und 43, **dadurch gekennzeichnet, dass** die erste Rolle (8) an einer ersten Führung (241) gleitet und oben ein Nockenprofil (242) aufweist, das auf eine Nockenstößelrolle (243) wirkt, angeschlossen an ein Element (244) zum Regulieren des durch die ersten Pressmittel (10) ausgeübten Druckes, um so die Position der ersten Rolle (8) zu regulieren und den Druck der ersten Rolle (8) auf die Kante (1b) zu reduzieren, wenn die Rolle sich von der Hauptachse (Z) fort bewegt; wobei Mittel (245) vorgesehen sind, die auf die ersten Pressmittel (10) wirken, um die anfänglichen Betriebsbedingungen wiederherzustellen.
45. Vorrichtung nach Patentanspruch 12, **dadurch gekennzeichnet, dass** die zweite Pressrolle (14) an dem mittleren Arm (18) entlang gleitet, so dass ihre Drehachse sich von der Hauptachse (Z) und der er-

sten Pressrolle (8) fort bewegt, um die genannte zweite Rolle daran zu hindern, sich an der Kante (1b) der Platte (1) zu verklemmen.

46. Vorrichtung nach Patentanspruch 45, **dadurch gekennzeichnet, dass** die zweite Rolle (14) an einer zweiten Führung (246) gleitet, die an dem mittleren Arm (18) angeordnet ist, und oben ein Nockenprofil (247) aufweist, das auf eine Nockenstößelrolle (248) wirkt, angeschlossen an Ventilmittel (249) zum Reduzieren des durch die zweiten Pressmittel (17) ausgeübten Druckes, welche auf solche Weise auf die zweite Rolle (14) wirken, dass deren Druck auf die Kante (1b) reduziert wird; wobei Federmittel (250) zwischen der zweiten Rolle (14) und dem mittleren Arm (18) wirken, um die anfänglichen Betriebsbedingungen wiederherzustellen.

#### Revendications

1. Une machine pour appliquer un placage de chants sur des panneaux (1), notamment des panneaux ayant des profils différemment conformés et pouvant être usinés sur des machines ayant au moins une table d'usinage (2) sur laquelle le panneau (1) est fermement maintenu et des moyens d'application (3) pour coller une bande de chant (4) sur un chant (1b), ladite machine comprenant lesdits moyens d'application (3) et ladite table d'usinage (2) qui sont mobiles l'un par rapport à l'autre, ladite machine étant **caractérisée en ce que** lesdits moyens (3) d'application de la bande de chant (4) sont constitués par un groupe ayant un arbre motorisé qui définit un axe principal (Z) vertical et qui supporte et entraîne au moins les éléments suivants :
  - un rouleau (6) de contact avec ledit chant (1b) du panneau (1), pouvant tourner librement autour de son axe vertical qui coïncide avec l'axe principal (Z) ;
  - des moyens (7) d'alimentation de colle ; et
  - au moins un premier rouleau de pression principal (8) destiné à exercer une pression sur ladite bande de chant (4), lesdits moyens (7) et ledit rouleau de pression (8) étant situés sur des côtés opposés du rouleau de contact (6) et pouvant osciller autour de l'axe principal (Z) en fonction du profil du panneau (1).
2. La machine selon la revendication 1, **caractérisée en ce que** lesdits moyens (7) d'alimentation de colle et ledit rouleau de pression principal (8) sont reliés à l'arbre qui définit l'axe principal (Z) de manière à pouvoir pivoter par rapport à l'ax (Z) en question pour suivre le profil du panneau (1).

3. La machine selon la revendication 1, **caractérisée en ce que** lesdits moyens (7) d'alimentation de colle sont reliés à l'arbre qui définit l'axe principal (Z) de manière à pouvoir se déplacer suivant une droite rectiligne et suivre ainsi le profil du panneau (1).
4. La machine selon la revendication 3, **caractérisée en ce que** lesdits moyens (7) d'alimentation de colle sont reliés à l'arbre qui définit l'axe principal (Z) par l'intermédiaire d'éléments de suspension (200) destinés à leur permettre d'osciller suivant une droite rectiligne et avec un mouvement irrotationnel dans un plan et le long de deux axes perpendiculaires à l'axe principal (Z).
5. La machine selon les revendications de 1 à 4, **caractérisée en ce que** ledit rouleau (6) est un rouleau qui applique de la colle sur ledit chant (1b) et est relié aux moyens (7) d'alimentation de colle qui distribuent la colle en question sur ce même rouleau (6).
6. La machine selon les revendications de 1 à 4, **caractérisée en ce que** ledit rouleau (6) est un rouleau de contact avec ledit chant (1b) et **en ce que** des moyens (100) sont prévus pour appliquer de la colle directement sur la bande de chant (4).
7. La machine selon la revendication 1, **caractérisée en ce que** ledit premier rouleau principal (8) de pression de la bande de chant (4) est placé en aval du rouleau de contact (6), par rapport à une direction (B) d'application de la bande de chant (4), peut tourner librement autour de son axe vertical et est relié à une première bielle (9) qui est associée de manière pivotante, à une extrémité, à l'arbre définissant l'axe principal (Z) ; la première bielle (9) étant reliée à des premiers moyens (10) destinés à presser le premier rouleau (8) contre le chant (1b) et à adapter en même temps la position angulaire de ce même rouleau par rapport à la position du rouleau de contact (6) en fonction du profil du chant (1b) en question du panneau (1) et de manière à maintenir pressé le premier rouleau (8) contre la bande de chant (4).
8. La machine selon les revendications de 1 à 4, **caractérisée en ce qu'elle** comprend des moyens (11) destinés à alimenter ladite bande de chant (4) dans la direction du chant (1b) du panneau (1), placés à proximité du rouleau de contact (6) et pouvant osciller, avec les moyens (7) d'alimentation de colle susmentionnés, autour de l'axe principal (Z) en fonction du profil du panneau (1).
9. La machine selon les revendications de 1 à 5, **caractérisée en ce qu'elle** comprend des moyens (11) destinés à alimenter ladite bande de chant (4)

- dans la direction du chant (1b) du panneau (1), placés à proximité du rouleau applicateur de colle (6) et pouvant osciller, avec les moyens (7) d'alimentation de colle susmentionnés, autour de l'axe principal (Z) en fonction du profil du panneau (1); lesdits moyens (11) d'alimentation de la bande de chant (4) étant réalisés de manière à définir un canal (12) à travers lequel la bande de chant (4), quand cela est requis, est alimentée au niveau du chant (1b) dans une zone (13) située entre le rouleau applicateur de colle (6) et le premier rouleau de pression principal (8).
10. La machine selon la revendication 1, **caractérisée en ce qu'elle** comprend un rouleau de pression secondaire (14) placé en aval du premier rouleau principal (8), par rapport à une direction (B) d'application de la bande de chant (4), et relié à une deuxième bielle (15) associée de manière pivotante, à une extrémité, à un premier arbre (16) relié à un premier bras central (18) qui supporte le premier rouleau principal (8) et définit un point de pivotement (G) du deuxième rouleau (14); des deuxièmes moyens de pression (17) étant prévus pour agir sur ce deuxième rouleau (14) et adapter sa position par rapport au premier rouleau (8) en fonction du profil du panneau (1) de manière à ce qu'il reste en contact avec la bande de chant (4).
11. La machine selon la revendication 7, **caractérisée en ce que** lesdits moyens (10) de pression et d'adaptation de la position du premier rouleau (8) sont constitués par ladite première bielle (9) pourvue d'une paire de roues dentées (19, 20) à chaque extrémité, dont l'une est calée de manière rigide sur l'arbre qui définit l'axe principal (Z); lesdites roues dentées (19, 20) ayant une première chaîne (21) enroulée autour d'elles; au niveau d'une branche (21a) de la chaîne (21), des premiers moyens d'entraînement (22) étant prévus, reliés à la première bielle (9) susmentionnée et agissant sur la première branche en question de manière à permettre à la bielle (9) de tourner dans les deux sens en fonction du profil du chant (1b); ladite première bielle (9) étant également pourvue d'un bras central (18) qui s'étend transversalement à la chaîne (21) et qui supporte de manière rotative, au niveau de son extrémité libre, le premier rouleau principal (8).
12. La machine selon la revendication 10, **caractérisée en ce que** lesdits deuxièmes moyens (17) de pression et d'adaptation sont constitués par une deuxième bielle (15) pourvue, à ses extrémités, de deuxièmes roues dentées (24, 25) correspondantes autour desquelles est enroulée une deuxième chaîne (26); la deuxième roue dentée (24) étant calée de manière rigide sur le premier arbre (16) et des deuxièmes moyens (27) étant prévus au niveau de l'autre roue dentée (25) pour mouvoir la deuxième bielle (15), en agissant sur la deuxième chaîne (26), et tourner le deuxième rouleau (14) par rapport à la position du premier rouleau (8) dans les deux sens, en fonction du profil du chant (1b) et de manière à maintenir ce même deuxième rouleau (14) en contact avec le chant.
13. La machine selon les revendications de 1 à 5, **caractérisée en ce que** lesdits moyens (7) d'alimentation de colle sont constitués par un bac à colle (28) placé dans un logement (29) prévu dans le groupe et situé à côté du rouleau applicateur (6); le bac à colle (28) étant pourvu d'une paire de rouleaux distributeurs (30) qui tournent librement autour des axes verticaux correspondants et sont placés entre ce même bac à colle (28) et le rouleau applicateur de colle (6) de manière à pouvoir distribuer uniformément la colle sur la surface extérieure de ce même rouleau (6).
14. La machine selon les revendications 8 et 9, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant (4) comprennent, à l'intérieur d'une structure de support et de couverture (31), au moins une paire de rouleaux motorisés (32) utilisés pour charger la bande de chant (4) et montés l'un en face de l'autre de manière à mouvoir la bande de chant (4) continue vers le chant (1b) dans une direction d'alimentation (D); des moyens (33) étant prévus pour détecter le passage de la bande de chant (4), placés en aval de la paire de rouleaux (32) par rapport à la direction d'alimentation (D) et agissant sur des moyens d'arrêt (34) correspondants placés en amont de la paire de rouleaux (32) par rapport à cette même direction d'alimentation (D) et destinés à arrêter l'alimentation de la bande de chant (4) en fonction de la position du groupe.
15. La machine selon la revendication 14, **caractérisée en ce que** lesdits moyens (33) de détection du passage de la bande de chant (4) sont constitués par au moins une paire d'unités optiques (35) placées l'une en face de l'autre.
16. La machine selon la revendication 14, **caractérisée en ce que** lesdits moyens d'arrêt (34) sont constitués par un élément presseur (36) agissant sur une section de la bande de chant (4) qui avance et par une paroi rectiligne (37) contre laquelle l'élément presseur (36) en question presse la bande de chant (4) pour l'arrêter.
17. La machine selon la revendication 14, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant (4) comprennent, en aval des moyens de détection (33) par rapport à la direction d'alimentation (D), un bras (38) destiné à guider et

- à distancer la bande de chant (4) d'un rouleau applicateur de colle (6), placé parallèlement à la bande de chant (4) et associé de manière pivotante à une extrémité, en (C), à la structure de support (31); ledit bras (38) étant pourvu de moyens d'entraînement (39) destinés à permettre à ce même bras de tourner au moins entre deux positions limites dont l'une est une position non opérationnelle, quand aucune bande de chant (4) n'est détectée, dans laquelle le bras (38) est éloigné d'une paroi (40) de guidage de la bande de chant (4), et au moins une position opérationnelle d'avancement, dans laquelle le bras (38) est rapproché de la paroi de guidage (40) et en contact avec la bande de chant (4) qui avance de manière à maintenir cette dernière sur une ligne d'avancement définie qui n'interfère pas avec le rouleau applicateur de colle (6).
18. La machine selon la revendication 14, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant (4) comprennent des moyens (41) de chauffage de la bande de chant (4) placés en amont des moyens d'arrêt (34) susmentionnés, par rapport à la direction d'alimentation (D), et destinés à rendre la bande de chant plus flexible quand cela est nécessaire.
19. La machine selon la revendication 18, **caractérisée en ce que** lesdits moyens de chauffage (41) comprennent une ou plusieurs unités (42) émettrices de rayons infrarouges à ondes courtes placées parallèlement entre elles et transversalement à la direction d'alimentation (D).
20. La machine selon la revendication 11, **caractérisée en ce que** ledit bras central (18) est pourvu de moyens (43) qui le bloquent dans une position fixe dans laquelle le premier rouleau principal (8) est éloigné du chant (1b) du panneau (1) quand un rouleau de contact (6) vient en contact avec le chant du panneau.
21. La machine selon la revendication 20, **caractérisée en ce que** lesdits moyens de blocage (43) comprennent un pivot vertical (44) relié avec le bras central (18) et qui peut se déplacer le long de son axe vertical entre une position basse non opérationnelle, dans laquelle le bras central (18) peut se déplacer, ce qui permet au premier rouleau principal (8) de venir en contact avec le chant (1b), et une position haute opérationnelle, dans laquelle le pivot (44) est en contact avec une paroi (45) solidaire d'une structure fixe (46) de la machine de manière à déterminer ladite position fixe; ladite paroi fixe (45) ayant une vis de réglage (47) qui peut être placée en face du pivot (44) afin de varier la position dans laquelle le bras central (18) s'arrête par rapport à
- cette même vis de réglage de manière à régler la distance entre le premier rouleau (8) et le chant (1b) dans la position fixe.
22. La machine selon la revendication 7, **caractérisée en ce que** ledit premier rouleau principal (8) de pression de la bande de chant (4) est monté de manière à pouvoir tourner librement sur un premier arbre (101) monté au niveau de l'extrémité libre du bras central (18) de la première bielle (9); des premières bagues en caoutchouc (102, 103) correspondantes étant prévues sur les extrémités de l'arbre (101), lesquelles bagues étant destinées à donner au premier arbre (101) et au premier rouleau (8) une flexibilité axiale de manière à ce qu'ils puissent s'adapter à différentes formes lorsqu'ils viennent en contact avec la bande (4) appliquée sur le chant (1b).
23. La machine selon la revendication 10, **caractérisée en ce que** ledit deuxième rouleau (14) de pression de la bande de chant (4) est monté de manière à pouvoir tourner librement sur un deuxième arbre (105) monté sur la deuxième bielle (15); des deuxième bagues en caoutchouc (106, 107) correspondantes étant prévues sur les extrémités du deuxième arbre (105), lesquelles deuxième bagues en caoutchouc (106, 107) étant destinées à donner au deuxième arbre (105) et au deuxième rouleau (14) une flexibilité axiale de manière à ce qu'ils puissent s'adapter à différentes formes lorsqu'ils viennent en contact avec la bande (4) appliquée sur le chant (1b).
24. La machine selon les revendications 22 et 23, **caractérisée en ce que** lesdits premier et deuxième arbres (101, 105) des premier et deuxième rouleaux (8, 14) correspondants sont reliés entre eux de manière rigide au niveau de leurs extrémités inférieures par l'intermédiaire d'un unique élément de support (104) ayant une colonne verticale (108) reliée à la deuxième bielle (15).
25. La machine selon la revendication 6, **caractérisée en ce qu'elle** comprend un élément de guidage (40) placé à côté du rouleau de contact (6), ledit élément de guidage (40) étant constitué par une pale (109) montée sur une tige (110) qui coulisse axialement entre une position non opérationnelle, dans laquelle la pale (109) est éloignée du rouleau de contact (6), et une position opérationnelle dans laquelle la pale (109) est rapprochée des moyens (100) d'application de colle et s'oppose à la bande de chant (4), du côté opposé à celui sur lequel la colle est appliquée.
26. La machine selon les revendications 8 et 9, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant (4) et lesdits moyens (7) d'alimentation de colle sont équipés de moyens

(110) destinés à adapter leur position, c'est-à-dire, à les faire pivoter par rapport à l'axe principal (Z) en fonction du profil du panneau (1).

27. La machine selon la revendication 26, **caractérisée en ce que** lesdits moyens d'adaptation (110) sont constitués par une structure (31) qui supporte et recouvre les moyens (11) d'alimentation de la bande de chant et les moyens (7) d'alimentation de colle et qui est libre de tourner autour de l'axe principal (Z), la partie supérieure de la structure (31) étant pourvue d'un guide linéaire (111) qui est couplé de manière coulissante à un contre-guide (112) réalisé sur une plaque de montage principale (113) qui est reliée de manière rotative à l'arbre définissant l'axe principal (Z) ; la plaque de montage principale (113) comprenant des moyens (114) qui la meuvent et meuvent également la structure de support (31) et qui sont destinés à permettre à la plaque (113) et à la structure de support (31) de pivoter par rapport à l'axe principal (Z) dans les deux sens.
28. La machine selon les revendications 1, 3 et 4, **caractérisée en ce que** lesdits éléments de suspension (200) sont placés entre la plaque de montage principale (113), qui est reliée à l'arbre définissant l'axe principal (Z), et une structure de couverture (31) qui loge les moyens (7) d'alimentation et les moyens (11) d'alimentation de la bande de chant.
29. La machine selon la revendication 28, **caractérisée en ce que** lesdits moyens de suspension (200) sont constitués par trois paires séparées de bielles (201, 202, 203) placées entre la plaque de montage (113) et la structure de couverture (31) et reliées à ces dernières au niveau de points extrêmes correspondants ; les bielles (201, 202, 203) étant également reliées entre elles au niveau de points intermédiaires correspondants par le biais d'un élément rigide (204) essentiellement en forme de "Y".
30. La machine selon la revendication 28, **caractérisée en ce qu'elle** comprend des moyens (205, 206) placés entre la plaque principale (113) et la structure de couverture (31) et utilisés pour contrôler la position de cette même structure de couverture (31) par rapport à l'axe principal (Z), c'est-à-dire, par rapport au profil du chant (1b) du panneau (1).
31. La machine selon la revendication 28, **caractérisée en ce que** lesdits moyens de contrôle de la position sont constitués par une paire de vérins (205, 206) montés à angle droit l'un par rapport à l'autre et associés à la structure de couverture (31), à une extrémité, et à un unique pivot de référence vertical (207) avec la tige correspondante ; le pivot vertical (207) étant aligné sur une ouverture (208) réalisée dans la plaque principale (113) et de l'autre côté de laquelle il y a un capteur inductif (209) logé dans cette même plaque (113) et destiné à détecter la présence du pivot (207) au niveau de l'ouverture (208) et à arrêter toute la machine lorsque le pivot (207) s'éloigne de l'ouverture (208), indiquant que la structure de couverture (31) est dans la mauvaise position par rapport au profil du chant (1b).
32. La machine selon les revendications 8 et 9, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant comprennent un chariot (210) destiné à guider et à amener la bande de chant (4) à proximité du chant (1b), au démarrage du cycle d'usinage, et équipé d'une base fixe (211) et d'une paire de bras (212, 213) placés en face de la base (211) de manière à définir un canal pour le passage de la bande de chant ; un vérin (214) étant prévu pour agir sur le chariot (210), ledit vérin (214) étant relié à la structure de couverture (31) et étant destiné à mouvoir le chariot (210) entre une position rentrée non opérationnelle et une position sortie opérationnelle dans laquelle il amène la bande de chant (4) à proximité du chant (1b).
33. La machine selon la revendication 32, **caractérisée en ce que** la tige du vérin (214) est reliée à l'extrémité du bras (212), qui est en forme de "L" et associé de manière pivotante en (F212) au corps du chariot (210) de manière à pouvoir tourner une portion de la bande de chant (4) dans une position de blocage durant le passage de la position rentrée à la position sortie, sous l'action de poussée du vérin (214), puis de tourner la bande de chant (4) en sens inverse dans une position de déblocage lorsqu'elle est appliquée sur le chant (1b), ledit déblocage étant effectué en faisant avancer un peu plus uniquement le chariot (210) tout en maintenant la tige fixe.
34. La machine selon les revendications 8 et 9, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant comprennent un bras (215) qui applique de la colle sur la bande de chant (4), ce bras (215) étant pourvu d'un contre-rouleau (216) au niveau de son extrémité libre et d'un vérin (217) qui le meut entre une position non opérationnelle, dans laquelle il est éloigné du rouleau applicateur de colle (6), et une position opérationnelle dans laquelle il est rapproché du rouleau applicateur de colle (6), avec la bande de chant (4) entre le rouleau (6) et le contre-rouleau (216).
35. La machine selon les revendications 8, 9 et 14, **caractérisée en ce que** les deux rouleaux (32) susmentionnés qui alimentent et chargent la bande de chant (4) ont des éléments cinématiques (218) correspondants qui leur permettent de tourner dans la direction d'alimentation (D) indépendamment du sens de rotation du rouleau applicateur de colle (6).



(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the grant of the patent:  
**12.02.2003 Bulletin 2003/07**

(51) Int Cl.7: **B27D 5/00, B27G 11/00,  
B29C 63/00**

(21) Application number: **99830166.7**

(22) Date of filing: **23.03.1999**

(54) **A panel edge banding device**

Kantenleimgerät

Machine de collage des bords d'une pièce en forme de plaque

(84) Designated Contracting States:  
**DE FR GB IT**

(30) Priority: **24.03.1998 IT BO980189**

(43) Date of publication of application:  
**29.09.1999 Bulletin 1999/39**

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**WO-A-97/05993** **DE-A- 3 517 194**

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## Description

[0001] The present invention relates to a device for applying edge banding to panels, especially panels of various different shapes, made of wood, plastic or similar materials and used preferably to make items of furniture.

[0002] At present, the operation by which edge banding, usually a strip of synthetic material, is glued to the edges of panels with curved profiles is carried out using equipment of various kinds, based on the different constructional principles followed by different manufacturers of woodworking machinery.

[0003] This equipment consists basically of a work table on which the panel to be edged is placed and means for applying the edging. The work table and the means for applying the edging move relative to each other so that the edging can be glued right round the perimeter of the panel.

[0004] By way of example, one solution for a piece of equipment of this kind is disclosed in German patent application DE - OS 35.17.194 in which the work table, with the panel on it, can rotate about a vertical axis, while the edge banding application means, comprising a roller that presses on the edge band while the latter is being fed, are driven only along the longitudinal axis of the machine in such a way as to copy the profile of the panel as it comes into contact with the pressure roller.

[0005] A more recent solution is disclosed in patent publications EP 276.358 and EP 510.231 which describe an apparatus that has a fixed table, to which the panel is secured, and a carriage equipped with an arm that mounts the devices for feeding the edge band, applying the edge band, machining the edge and cutting off the edge band. The carriage moves along two controlled axes X and Y above and in parallel with the surface of the panel to apply the edge band to the panel and finish the edge.

[0006] These solutions envisage the use of pre-glued edge banding which, just before being applied to the panel, is heated in such a way as to reactivate the glue. The disadvantage of this method is that, since the amount of glue forming the layer of pre-applied glue must be limited, it is not always enough to "cover" the pores in the edge of the panel. In short, machines of this kind sometimes work with "less than sufficient glue".

[0007] There are also "through" machines, that is to say, linear edge banding machines designed to apply edge bands to panels with straight edges and in which the panel is fed relative to the edge banding device, which remains fixed: with these machines, the glue may be applied either to the panel or to the edge band.

[0008] The aim of the present invention is to overcome the disadvantages mentioned above by providing a panel edge banding device that is extremely easy to use, compact, adaptable to panels of any shape, quick to install and capable of securely joining the panel edge to the edge band with glue.

[0009] The technical characteristics of the invention according to the above mentioned aims are described in the claims below and the advantages of the invention will become more apparent from the detailed description which follows, with reference to the accompanying drawings, which illustrate preferred embodiments of the invention and in which:

- Figure 1 shows a panel machine equipped with the edge banding device made according to the present invention, in a schematic top plan view with some parts cut away in order to better illustrate others;
- Figure 2 shows the panel edge banding device made according to the present invention in a perspective view, scaled-up compared to Figure 1 and with some parts cut away in order to better illustrate others;
- Figure 3 is a top plan view, with some parts cut away in order to better illustrate others, of the panel edge banding device as shown in Figure 2;
- Figure 4 is a top plan view, with some parts cut away and others in cross section, of some of the working parts of the device shown in the illustrations listed above;
- Figure 5 is a schematic top plan view, with some parts cut away in order to better illustrate others, of some of the drive parts of the device disclosed herein;
- Figures 6 to 9 are schematic top plan views of a series of working configurations that can be obtained with the device disclosed on a panel with a straight and concave profile;
- Figures 10 to 13 are schematic top plan views of a series of working configurations that can be obtained with the device disclosed on a panel with an angled profile;
- Figure 14 is a scaled-up detail of Figure 3, viewed from "J", showing a unit consisting of two pressure rollers in a side view with some parts in cross section and others cut away;
- Figures 15 and 16 are perspective views from below and above, respectively, and with some parts cut away in order to better illustrate others, of the twin-roller unit illustrated in Figure 14, equipped with means for adjusting the position of the rollers;
- Figure 17 is a schematic top plan view, with some parts cut away in order to better illustrate others, of another embodiment of the working parts illustrated in Figure 5;
- Figure 18 shows the device made according to the present invention in a perspective view from K in Figure 3;
- Figure 19 is a side view, with some parts cut away in order to better illustrate others, of the device illustrated in Figure 18;
- Figure 20 is a perspective, exploded view of a part of the device disclosed showing the means for suspending a glue unit and an edge banding feed unit;

- Figure 21 is a longitudinal section of the area where the glue unit and the edge band feed unit are suspended, also showing some parts in perspective and partly cut away in order to better illustrate others;
- Figures 22 and 23 are top plan views, with some parts in cross section, of another embodiment of the edge band feed unit in two different working configurations;
- Figure 24 is a top plan view, with some parts in cross section, of yet another embodiment of the edge band feed unit shown in Figures 22 and 23;
- Figure 25 illustrates a part of the glue and edge band feed unit in a perspective view with some parts cut away in order to better illustrate others;
- Figure 26 illustrates a detail of Figure 25 in a schematic side view;
- Figure 27 is a perspective, exploded view of a plate that forms part of an upper cover of the glue and edge band feed unit, showing also some parts of the drive gear with reference to Figure 21;
- Figure 28 is a side view, with some parts in cross section, of an end trimming tool that can be applied to the edge banding device disclosed;
- Figure 29 is a top plan view, with some parts cut away in order to better illustrate others, of a feed cylinder drive unit;
- Figures 30 and 31 show the pair of pressure rollers in a front view and a perspective view, respectively, and with some parts cut away in order to better illustrate others;
- Figure 32 is a top plan view of a part of the pair of pressure rollers shown in Figures 30 and 31;
- Figure 33 is a cross section through line XXIII-XXIII in Figure 32.

[0010] With reference to the accompanying drawings, described above, in particular, Figure 1, the device disclosed herein applies edge banding to panels 1 made of wood or other wood-based material, plastic or similar material and used preferably to make items of furniture.

[0011] As shown in Figure 1, the edges of the panels 1 may have differently shaped profiles, for example, convex, angled or concave, and the edge banding should preferably but not necessarily be applied uninterruptedly right around the panel 1.

[0012] The panels 1 can be processed in machines whose basic structure consists of at least one work table 2 on which the panel 1 is securely held, and application means 3 for gluing an edging band 4 to an edge 1b of the panel 1 in a defined direction B.

[0013] The application means 3 and the work table 2 can move relative to each other and, in Figure 1, by way of example, they move along defined axes, the application means 3 along an axis X on a crossbar 48 equipped with a rail 49 on which the application means 3 run in both directions, while the work table 2 runs along an axis Y perpendicular to the axis X (in the case illustrated, the

feed direction B is opposite to the feed direction B1 of the table 2 with the panel 1 on it).

[0014] Obviously, this machine is illustrated by way of example only and the device can be applied to other types of machines without departing from the scope of the inventive concept.

[0015] The application means 3 (see also Figures 2 and 3) consist of a unit with a motor-driven, tubular shaft 5, that forms a vertical main axis Z and that mounts and, through motors and appropriate drive gear (not illustrated) located inside the shaft 5, drives the following items: a contact roller 6, which, as explained in more detail below, may also be used to apply glue to the edge 1b of the panel 1, said roller 6 rotating about its vertical axis, which coincides with the main axis Z; a first main pressure roller 8 of the edge band 4 and glue feed means 7. The last two items are positioned on opposite sides of the roller 6 and can oscillate about the main axis Z in accordance with the profile of the panel 1.

[0016] The oscillation of the main roller 8 and of the glue feed means 7 may be performed in two different ways. In one (the first embodiment described below), both the elements are able to tilt and the glue feed means 7 are also able to move in such a way as to follow the profile of the panel 1.

[0017] With reference in particular to Figure 4, in a first embodiment in which the roller 6 is also used to apply glue to the edge 1b, the surface of the roller 6 is in contact with the glue feed means 7, the glue feed means 7 consisting basically of a glue pot 28 in a housing 29 made in the unit and located near the applicator roller 6. The glue pot 28 is equipped with a pair of spreader rollers 30 which turn freely about the corresponding vertical axes and are located between the glue pot 28 and the glue applicator roller 6 so that they can uniformly spread glue on the outer surface of the roller 6 which in turn applies it to the edge 1b of the panel 1.

[0018] In a second embodiment, illustrated schematically in Figure 17, in which the roller 6 is simply a contact roller for the edge 1b, there are glue feed means 100, again consisting of a glue pot 28' and a pair of spreader rollers 30' in contact with another roller 6' which applies glue to the surface of the edge band 4 in direction D. The roller 6' is located downstream of the contact roller 6 relative to the feed direction D of the edge band 4, whose other surface is guided by a guide element 40.

[0019] The guide element 40 (see Figure 17 again) consists of a blade 109 mounted on a rod 110 which is connected with a supporting structure 31 and which slides axially between an idle position, in which the blade 109 is away from the glue applicator roller 6' and a working position (shown in Figure 17) in which the blade 109 is close to the roller 6' and opposes the edge band 4. As described in more detail below, the guide element 40 can be used as such even in the embodiment where the roller 6 is also used to apply glue to the edge 1b.

[0020] For convenience, we will now describe the em-



bodiment where the roller 6 is used to apply glue to the edge 1b of the panel 1, although the structure of the unit described below is identical in both the embodiments mentioned above.

[0021] The first main pressure roller 8 of the edge band 4 is located downstream of the applicator roller 6 relative to the edge banding direction B, can turn freely about its vertical axis and is linked to a first connecting-rod 9 which is in turn pivoted to the shaft forming the main axis Z (see Figure 5 in particular).

[0022] The first connecting-rod 9 is connected to first means 10 for pressing the first roller 8 against the edge 1b and at the same time adjusting the angular position of the roller relative to the position of the glue applicator roller 6 in accordance with the profile of the edge 1b of the panel 1. In this way, the means 10 keep the first roller 8 pressed against the edge band 4 that has just been laid on the edge 1b.

[0023] Looking in more detail and with reference also to Figures 2, 3 and 5, the first pressure and adjusting means of the first main roller 8 consist of the first connecting-rod 9 pivoted to the shaft forming the main axis Z.

[0024] On the ends of the first connecting-rod 9, there is a pair of toothed wheels 19 and 20 around which a first chain 21 is looped. At one branch 21a of the chain 21, there are first drive means 22, connected to the first connecting-rod 9 and acting on the first branch in such a way as to allow the connecting-rod to turn in both directions (see arrows F in Figure 5) according to the profile of the edge 1b. In other words, the first drive means 22, consisting for example, of a linear actuator, are extended and retracted (see arrow F1 in Figure 5) in such a way as to cause the first connecting-rod 9 to turn since the toothed wheel 19 is keyed to the main shaft 5, that forms the main axis Z.

[0025] The main pressure roller 8 is connected to the first connecting-rod 9 by a central arm 18 which is attached at one end to the connecting-rod itself (or to a first upper guard 150 where the linear actuator 22 is also connected), which extends crossways with respect to the chain 21, and which, at its other end, mounts the main roller 8. The latter is therefore outside the working area of the first connecting-rod 9.

[0026] As shown in Figures 2 to 5, besides the first main roller 8, there is at least one secondary pressure roller 14 located downstream of the first main roller 8 relative to the edge banding direction B.

[0027] The second roller 14 is linked to a second connecting-rod 15 pivoted at one end to a first shaft 16, mounted on the first arm 18, which is coaxial with the first main roller 8 and which forms a pivot point G of the second roller 14.

[0028] There are also second means 17 for pressing on the second roller 14 and adjusting its position relative to the first roller 8 in accordance with the profile of the edge 1b of the panel 1, so that it remains in contact with the edge band 4 that has been applied.

[0029] Looking in more detail, the second pressing and adjustment means 17 consist of the second connecting-rod 15 having, on the ends of it, corresponding second toothed wheels 24 and 25 around which a second chain 26 is looped, the second toothed wheel 24 being securely keyed to the first shaft 16.

[0030] At the other toothed wheel 25, there are second means 27 for driving the second connecting-rod 15, the means 27 consisting, for example, of a rotary actuator acting on the toothed wheel 25 to turn the second roller 14 in both directions (see arrow F2 in Figure 5), relative to the position of the first roller 8, in accordance with the profile of the edge 1b and in such a way as to keep the second roller 14 in contact with the edge.

[0031] In short, structuring the two pressure rollers in this way provides two elements (both exerting pressure on the edge band but to different extents, the first roller more than the second) which are connected to each other in sequence and which are both able to rotate, the first about the pivot point Z and the second about the pivot point G, where the point G is the instantaneous position assumed by the first roller 8.

[0032] As also shown in Figures 14, 15 and 16, the first and second pressure rollers 8 and 14 (which are preferably made of steel) are mounted in such a way that they can turn freely on corresponding first and second shafts 101 and 105. The first shaft 101 is mounted at the free end of the central arm 18, while the second shaft 105 is mounted directly on the second connecting-rod 15.

[0033] On the ends of each of the two shafts 101 and 105 there are corresponding first and second rubber rings 102, 103 and 106, 107 connected to a single element 104, at the lower end, that supports each of the two units consisting of the shaft 101 or 105, the roller 8 or 14 and the rings 102, 103 or 106, 107.

[0034] In practice, the first and second shafts 101 and 105 are rigidly connected to each other at their lower ends by the single supporting element 104 that has, in turn, a vertical joining column 108 connected to the second connecting-rod 15.

[0035] The two pairs of rings 102, 103 and 106, 107 provide the corresponding rollers 8 and 14 with axial flexibility to enable the related shafts 101 and 105 and the corresponding rollers 8 and 14 to adjust to different shapes when they come into contact with the band 4 applied to the edge 1b.

[0036] Thanks to this flexibility, the two rollers easily adapt to the shape of the surface being pressed, compensating for imperfect assembling of the rollers or irregularities on the edge 1b of the panel 1 caused by previous machining. That means that each of the rollers 8 and 14 maintains a high specific thrust on the edge band 4 and, hence, allows good product quality to be achieved.

[0037] The numeral 11 in Figure 4 indicates means for feeding the edge band 4. The means 11 are located close to the roller 6 that applies glue to the edge 1b and

move together with the glue feed means 7.

[0038] The means 11 are made in such a way as to form a channel 12 through which the edge band 4, when required, is fed to the edge 1b in an area 13 between the applicator roller 6 and the two pressure rollers 8 and 14. Thus, the edge band 4 is placed in contact with the surface of the edge 1b and pressed by the rollers 8 and 14 to attach it permanently to the panel edge.

[0039] Looking in more detail, the feed means 11 comprise a supporting and covering structure 31 which houses a first pair of motor-driven rollers 32 for feeding the edge band 4 (which comes from a magazine that is not illustrated), the rollers being fitted opposite each other in such a way as to move the continuous edge band towards the edge 1b in the feed direction D.

[0040] Downstream of the pair of rollers 32, relative to the feed direction D, there are means 33 for detecting the passage of the edge band 4, operating on related stop means 34 located upstream of the pair of rollers 32, again relative to the feed direction D. The means 34 are designed to stop the feeding of the edge band 4 according to the position of the unit relative to the edge 1b.

[0041] The edge band 4 detecting means 33 may consist (see Figure 4 again) of at least one pair of optical units 35 placed opposite each other. The stop means 34 may consist of: a presser element 36 which, when activated, acts in a direction transversal to the feed direction D on a section of the edge band 4 being fed; and a straight wall 37 against which the presser element 36 presses the edge band 4 to stop it.

[0042] In addition to these elements, the supporting structure 31 also houses an arm 38 designed to guide the edge band 4 and located downstream of the detecting means 33 relative to the feed direction D. The guide arm 38 is positioned parallel to the edge band 4 and is pivoted at one end, at C, to the supporting structure 31.

[0043] The arm 38 has drive means 39 (which may consist of a cylinder, illustrated schematically as a block in Figure 4), the means 39 allowing the arm to rotate between two or, preferably, three positions: an idle position (shown by a continuous line in Figure 4) when no edge band 4 is detected and in which the arm 38 is close to the glue pot 28, and at least two working feed positions (of which one is clearly visible in Figures 6 to 13 and shown by dashed lines in Figure 4) in which the arm 38 is away from the glue pot 28, close to the guide element 40 and in contact with the edge band 4 in such a way as to keep the latter on a defined feed line which does not interfere with the glue applicator roller 6 limits the risk of the edge band springing back against the glue applicator roller 6. Obviously, the working angle of the arm 38 depends on the thickness of the edge band 4.

[0044] The numeral 41 indicates means for heating the edge band 4 located upstream of the stop means 34, relative to the feed direction D, and designed to make the edge band more pliable, especially when the edge banding being applied is quite thick.

[0045] The heating means 41 comprise one or more

short-wave infrared ray emitting units 42 positioned parallel to each other and transversal to the direction of feed D.

[0046] As mentioned above, the feed means 11 just described and the glue feed means 7 can tilt about the shaft that forms the main axis Z.

[0047] This angular adjustment is accomplished by means 110 (visible clearly in Figures 18 and 19) and partly in Figures 2 and 3) for adjusting the position of the means 11 and 7, that is, tilting the latter about the main axis Z according to the profile of the panel 1.

[0048] The adjustment means 110 consist of the above mentioned supporting and covering structure 31 of all the parts just described that form the means 11 for feeding the edge band 4 and the means 7 for feeding the glue, the structure 31 being free to turn about the main axis Z.

[0049] At the top of the supporting structure 31, there is a linear guide 111, that is slidably coupled to a counter-guide 112 made on a main mounting plate 113 that is rotatably connected to the shaft 5 forming the main axis Z.

[0050] The main mounting plate 113 comprises means 114 that drive it and, hence, also drive the supporting structure 31. The means 114 enable the plate 113 and the supporting structure 31 to tilt about the main axis Z in both directions (see arrow F110 in Figures 2, 3 and 18) thanks to the relative sliding of the guide 111 and the counter-guide 112.

[0051] The means 114 may consist of a cylinder 115 connected with the mounting plate 113 and whose stem 115s is connected to a fixed wall 116 in such a way that the stem can extend and retract in order to tilt the mounting plate 113 and the supporting structure 31 in accordance with the profile of the edge 1b of the panel 1.

[0052] Looking again at the above mentioned central arm 18, forming part of the first connecting-rod 9 and mounting the first roller 8, the arm 18 is equipped with means 43 that lock it in a fixed position in which the first main roller 8 is away from the edge 1b of the panel 1 when the glue applicator roller 6 comes into contact with the panel edge (see Figures 2, 15 and 16): this configuration is used, preferably during the initial stages of the edge banding operation to prevent the glue on the panel edge 1b from being smeared on the surface of the roller 8 and subsequently soiling the outer surface of the edge band 4.

[0053] The locking means 43 comprise a vertical pin 44 connected with the arm 18 and which can move along its vertical axis between a lowered, idle position in which the arm 18 is able to move, allowing the first main roller 8 to come into contact with the edge 1b, and a raised, working position (shown in Figure 2), in which the pin 44 is in contact with a wall 45 attached to a fixed structure 46 of the device (forming part of the shaft 5) in such a way as to determine said fixed position.

[0054] The fixed wall 45 has a set screw 47 that can be placed opposite the pin 44 in order to vary the posi-

tion in which the arm 18 stops relative to the set screw so as to adjust the distance between the first roller 8 and the edge 1b in the fixed position.

[0055] All the working parts described up to now are controlled and driven by a control unit 50, illustrated schematically as a block in Figure 2.

[0056] This unit may be a conventional, CNC system programmed according to the profile of the panel to be edge banded and acting on the device and on the work table 2.

[0057] As can be deduced from the above description, the edge banding device operates basically as follows starting from the configuration illustrated in Figure 4, that is to say, with the edge band 4 stopped inside the channel 12 by the locking means 34 and the arm 18 locked in the fixed position by the raising of the pin 44.

[0058] The unit is moved close to the edge 1b of the panel 1 until the edge 1b and the glue applicator roller 6 touch, while the means 50 adjust the position of the mounting plate 113 and the structure 31, acting also on the piston 115, in such a way as to put it in the position most suitable to apply the glue and feed the edge band 4 without interfering with the edge 1b. The unit starts moving in the application direction B, while the edge band 4 is fed towards the outfeed area 13 by the rollers 32. When the edge band 4 comes into contact with the edge 1b, the arm 18 is released by the lowering of the pin 44 and can start pressing on the edge band 4, together with the second roller 14, in order to join it to the edge 1b (see Figure 6).

[0059] This working configuration continues until the edge 1b right around the panel is covered, the unit even assuming "limit" positions as it follows the profile of the edge: Figures 7 to 9, for example, show the unit as it works on an edge with a profile that forms a right-angled concavity, and highlight the extreme flexibility of the components, especially the tilting (indicated by the arrows E) of the pressure rollers and of the glue and edge band 4 feed unit which allows them to automatically move to the most suitable working position according to the edge profile and without slowing down their operation.

[0060] Figures 10 to 13 show another working "limit" condition in which the unit disclosed can apply the edge band quickly and reliably, with top-quality results, thanks also to the double joint of the pressure rollers, shown clearly in Figure 13.

[0061] Without changing the structure of the components described until now, and as mentioned at the beginning of the present description, the glue feed means 7, incorporated in the edge band feed means 11, may be connected to the shaft which forms the main axis Z through suspension elements 200 designed to enable them to oscillate in a straight line with an irrotational movement in a plane and along two axes perpendicular to the main axis Z.

[0062] Looking in more detail (see Figures 20 and 21), the suspension elements 200 are located between the

main mounting plate 113, connected to the fixed structure of the device, and the covering structure 31 that houses the feed means 7 and the edge band feed means 11 (in these illustrations, the means 7 and 11 are not shown because they lie under the mounting plate 113/covering structure 31 assembly).

[0063] The suspension elements 200 consist of three separate pairs of connecting-rods 201, 202, 203 located between the mounting plate 113 and the covering structure 31 and linked to them at corresponding limit points. The three pairs of connecting-rods are also connected to each other at corresponding intermediate points by a rigid, substantially Y-shaped element 204: thanks to this configuration, the entire underlying unit can be moved in a plane instead of tilted as described above.

[0064] This particular movement requires means of controlling the position of the covering structure 31 relative to the profile of the edge 1b to be edge banded, that is to say, between the main mounting plate 113 and the covering structure 31, there may be means for controlling the position of the covering structure 31 relative to the main axis Z.

[0065] Said position control means may comprise a pair of cylinders 205 and 206 (the latter is only partly visible in Figure 21) fitted at right angles to each other and linked to the covering structure 31, at one end, while the relative stem is connected to a single vertical reference pin 207 connected to the covering structure 31. The vertical pin 207 is lined up with an opening 208 made in the main mounting plate 113 and on the other side of which there is an inductive sensor 209 (drawn with a dashed line), housed in the mounting plate 113. The sensor is designed to detect the presence of the pin 207 at the opening 208 and to stop the entire device if the pin 207 moves away from the opening 208. The moving away of the pin from the opening indicates that the covering structure 31 is in the wrong position relative to the edge 1b and leads to a program fault in the control unit 50.

[0066] The different way of tilting the covering structure 31 makes it possible to change the arrangement of the edge band 4 feed means 11 (along a 90° arc, which is a more compact arrangement than the one described above) but not the way they are made within the covering structure (as can be seen in Figures 22, 23, and 24).

[0067] An addition to the elements described above is illustrated in Figures 22 and 23, where a carriage 210 has been added to guide and carry the edge band 4 from the pair of feed rollers 32 to the proximity of the edge 1b at the start of the work cycle, that is, when the edge band starts being applied to the panel 1.

[0068] The carriage 210 has a fixed base 211 and a pair of arms 212 and 213 located opposite the base 211 in such a way as to form the continuation of the channel 12 for the passage of the edge band. Acting on the carriage 210 there is a cylinder 214 connected to the covering structure 31 and designed to drive the carriage 210 from a retracted, idle position (see Figure 22) to a for-

ward, working position in which it carries the edge band 4 close to the edge 1b (see Figure 23). The edge band 4 is carried at the same speed as that at which the rollers 32 feed it in direction D.

[0069] The stem of the cylinder 214 is connected to the end of the arm 212, which is L-shaped and pivoted at F212 to the body of the carriage 210 in such a way as to allow a portion of the edge band 4 to be rotated to a stop position in direction FC during the passage from the retracted to the forward position, under the thrusting action of the cylinder 214, and then to rotate the edge band 4 to a released position in the opposite direction FS when it is applied to the edge 1b. The release is effected by further moving forward only the carriage 210, with the stem fixed and acting this time as a centre of rotation.

[0070] Once the edge band 4 has been loaded, the carriage 210 returns to the retracted, idle position and stays there until the end of the working cycle on the current panel.

[0071] In another embodiment, illustrated in Figure 24, the edge band feed means 11 further comprise a feed arm 215 that applies glue to the edge band 4, this arm being equipped with a counter roller 216 at its free end and a cylinder 217 that drives it from an idle position, in which it is away from the glue applicator roller 6 and a working position (indicated by the arrow F215 in Figure 24), in which it is close to the glue applicator roller 6, with the edge band 4 (not illustrated in this case) between the roller 6 and the counter roller 216.

[0072] The loading of the edge band 4 may be effected again independently of the direction of rotation of the glue applicator roller 6 because the two rollers 32 that feed and load the edge band 4 have corresponding kinematic elements 218 which enable them to also rotate in the feed direction D in such a way as to feed the edge band but independently of the direction of rotation of the glue applicator roller 6.

[0073] The kinematic elements 218 (see Figures 21 and 27) consist of a pair of first toothed wheels 218a and 218b (drawn with dashed lines in Figure 21) keyed to a single rotating shaft 219 connected to the feed rollers 32 through a unit that transmits motion to all the means for feeding the edge band and the glue (not illustrated in this case). The two first toothed wheels 218a and 218b are housed at the top of the covering structure 31 and each of the two first toothed wheels 218a and 218b meshes with corresponding second toothed wheels 220 and 221 which are linked to the drive elements 222 of the device, are connected to the (motor-driven) shaft forming the main axis Z, and are driven in opposite directions of rotation.

[0074] In practice, the kinematic elements 222 comprise a drive wheel 222a on the shaft forming the main axis Z and meshed with a driven wheel 222b which enable drive to be transmitted to the two above mentioned second toothed wheels 220 and 221: one of the second toothed wheels, the one labelled 220, meshes directly

with one of the first toothed wheels, the one labelled 218a, while the other second toothed wheel, the one labelled 221, meshes with an idle wheel 221a which meshes with the first wheel 218b.

5 [0075] Each of the first toothed wheels 218a and 218b is equipped with free wheel means 218c designed to enable it to turn freely on the shaft 219 when the shaft forming the main axis Z turns in the direction opposite to its own.

10 [0076] The covering structure 31 also comprises means 223 for detecting the length of the edge band 4 and cutting off the edge band 4 when it has gone right around the panel to join the starting end 4a that was applied first.

15 [0077] As shown in Figures 24, 25 and 26, the detecting means 223 consist of a rod 224, which is pivoted at F224 to the covering structure 31 and which can rotate between an idle position (see Figure 25) in which it is withdrawn inside the covering structure 31, and a working position (accomplished by conventional drive means which are not illustrated), in which it protrudes from the structure (see arrow F224a in Figures 24 and 26) when necessary and is positioned close to the edge 1b, with a part in contact with the lower surface of the panel 1 to be edge banded.

20 [0078] The rod 224 is equipped with presence sensors 225 and 226 located opposite each other and designed to detect the starting end 4a of the edge band 4 (protruding from the edge 1b and thus blacking out the two sensors) and to send a signal to the control unit 50 which processes the signal and activates a cutoff unit 227, preferably located between the edge band 4 loading rollers 32 and the carriage 210, which cuts the edge band in a direction indicated by the arrow F227 in Figure 22 and thanks to a front stop 227s located on the channel 12.

25 [0079] The calculation for cutting the edge band 4 at the correct point is made on the basis of preset parameters programmed in the control unit 50.

30 [0080] The cutoff unit 227 (see Figure 28) consists of a circular cutter 228 mounted on a base 229 that is slidably connected to the covering structure 31 and linked to a cylinder 230 that drives it between a forward working position and a retracted, idle position (see arrow F228 in Figure 28).

35 [0081] Figure 29 shows the lower part of the glue feed means 7, that is, the part that controls the pair of glue spreader rollers 30 (not illustrated in Figure 29).

40 [0082] The two glue spreader rollers 30 are equipped with independent drive means 231 which open and close them in accordance with the direction of rotation of the glue applicator roller 6 and even according to where the glue is to be applied (on the panel edge 1b or on the edge band 4).

45 [0083] The drive means 231 consist of a vertical shaft 232 and 233 to connect each cylinder 30, each shaft 232, 233 being equipped with a rod 234, perpendicular to it and acted upon by cam means 235 which are in turn

acted upon by drive means 236 in such a way as to open one spreader roller 30 and close the other and vice versa (in the illustration, the shaft 232 has opened its spreader roller - see arrow F232 - while the shaft 233 is keeping its cylinder 30 in the closed position).

[0084] Between the two rods 234, there are spring means 237 designed to keep the rods apart so as to keep the corresponding spreader rollers 30 closed when the spreader rollers themselves and the drive cylinder 236 are in the idle position.

[0085] Looking in more detail, the above mentioned cam means 235 consist of a tubular carriage 238 within which the shafts 232, 233 can be housed, each shaft having a cam follower pin 239 placed in contact with the corresponding cam profiles 240 made on a wall of the carriage 238: this way, when the drive means 236 (consisting of a two-position pneumatic cylinder connected to the carriage 238) are moved in one direction or the other, one or other of the spreader rollers 30 is opened (see arrow F236 in Figure 29).

[0086] Figures 30 to 33 show the part of the device comprising the first and second pressure rollers 8 and 14 which press the edge band 4 on the panel 1.

[0087] From these illustrations it can be seen that the first pressure roller 8 can slide along the central supporting arm 18 so that its axis of rotation moves away from the main axis Z (see arrow FZ in Figure 31): this mechanism prevents the first roller 8 from jamming on the edge 1b of the panel 1 when it meets particularly sharp corners (for example at right angles) where the thrust applied by the first pressure means 10 to the roller 8 would risk breaking the roller if it were not free to slide.

[0088] The first roller 8 slides on a first guide 241 and, at the top of it, has a cam profile 242 that acts on a cam follower roller 243 connected to an element 244 used to regulate the pressure exerted by the first pressure means 10 so as to adjust the position of the first roller 8. The regulator 244 is designed to reduce the pressure of the roller 8 on the edge 1b (see arrow F244 in Figure 30) by releasing pressure from one chamber to the other of the cylinder forming the first drive means 22, as the roller moves away from the main axis Z on account of the force tending to jam it and created by the cam follower roller 243 moving back (see arrow F243).

[0089] Means 245 are envisaged to act on the first pressure means 10 so as to restore initial working conditions when the jamming force stops. These means may be constituted by the control unit 50 or by another cylinder 244c mounted in parallel with the cylinder 22 and always set to thrust conditions in parallel with the cylinder 22.

[0090] The above description of the first pressure roller 8 also applies to the second pressure roller 14, which slides along the central arm 18 so that its axis of rotation moves away from the main axis Z (see arrow F246 in Figures 32 and 33).

[0091] The second roller 14 slides on a second guide 246 made on the central arm 18 and, at the top of it, the

roller has a cam profile 247 that in turn acts on a cam follower roller 248 connected to regulator valve means 249 used to reduce the pressure exerted by the second pressure means 17 (that is, of the cylinder 27) acting on the second roller 14 in such a way as to reduce its pressure on the edge 1b.

[0092] When the force tending to jam the second roller 14 stops, the initial working conditions are restored by spring means 250 connected to the roller and to the central arm 18 (see arrow F250 in Figure 31).

[0093] The device as described above therefore achieves the aims of the invention by providing an extremely compact unit equipped with a reference roller which may be used either to apply glue to the panel edge or simply as a contact roller used to reference the panel. Working in conjunction with this roller, on each side of it, there are compact operating units which are flexibly positioned thanks to the possibility of oscillating either by tilting about the main reference axis or moving in a straight line and which are structured in such a way as to apply edge banding quickly and reliably, even to panels with profiles having extremely "difficult" shapes.

## 25 Claims

1. A device for applying edge banding to panels (1), especially panels which have differently shaped profiles and which can be worked on machines having at least one work table (2) on which the panel (1) is securely held, and application means (3) for gluing an edging band (4) to an edge (1b), the device comprising the application means (3) and the work table (2) being able to move relative to each other, said device being **characterized in that** the application means (3) for applying the edge band (4) consists of a unit with a motor-driven, shaft forming a vertical main axis (Z) and that mounts and drives at least the following items:

- a contact roller (6) for the edge (1b) of the panel (1), capable of rotating freely about its vertical axis, which coincides with the main axis (Z) ; - means (7) for feeding glue and - at least one first main pressure roller (8), which presses on the edge band (4), said means (7) and pressure roller (8) located on opposite sides of the contact roller (6) and able to oscillate about the main axis (Z) in accordance with the profile of the panel (1).

2. The device according to claim 1, **characterized in that** the glue feed means (7) and the main pressure roller (8) are connected to the shaft forming the main axis (Z) in such a way that they can tilt about the axis (Z) so as to follow the profile of the panel (1).

3. The device according to claim 1, **characterized in**

that the glue feed means (7) are connected to the shaft forming the main axis (Z) in such a way that they can move in a straight line and thus follow the profile of the panel (1).

4. The device according to claim 3, **characterized in that** the glue feed means (7) are connected to the shaft which forms the main axis (Z) through suspension elements (200) designed to enable them to oscillate in a straight line with an irrotational movement in a plane and along two axes perpendicular to the main axis (Z).
5. The device according to claims 1 to 4, **characterized in that** the roller (6) is a roller that applies glue to the edge (1b) and is connected to the glue feed means (7) which spread glue on the roller (6).
6. The device according to claims 1 to 4, **characterized in that** the roller (6) is a contact roller for the edge (1b) and **in that** there are means (100) for applying glue directly to the edge band (4).
7. The device according to claim 1, **characterized in that** the first main pressure roller (8) of the edge band (4) is located downstream of the contact roller (6), relative to the direction (B) in which the edge band (4) is applied, can turn freely about its vertical axis and is linked to a first connecting-rod (9) which is in turn pivoted at one end to the shaft forming the main axis (Z); the first connecting-rod (9) being connected to first means (10) for pressing the first roller (8) against the edge (1b) and at the same time adjusting the angular position of the roller relative to the position of the contact roller (6) in accordance with the profile of the edge (1b) of the panel (1) and in such a way as to keep the first roller (8) pressed against the edge band (4).
8. The device according to claims 1 to 4, **characterized in that** it comprises means (11) for feeding the edge band (4) in the direction of the edge (1b) of the panel (1), located close to the contact roller (6) and able to oscillate, together with the glue feed means (7) about the main axis (Z) in accordance with the profile of the panel (1).
9. The device according to claims 1 to 5, **characterized in that** it comprises means (11) for feeding the edge band (4) in the direction of the edge (1b) of the panel (1), located close to the glue applicator roller (6) and able to oscillate, together with the glue feed means (7) about the main axis (Z) in accordance with the profile of the panel (1); said edge band (4) feed means (11) being made in such a way as to form a channel (12) through which the edge band (4), when required, is fed to the edge (1b) in an area (13) between the glue applicator roller (6) and the

first main pressure roller (8).

10. The device according to claim 1, **characterized in that** it comprises a secondary pressure roller (14) located downstream of the first, main roller (8) relative to a direction (B) in which the edge band (4) is applied and linked to a second connecting-rod (15) pivoted at one end to a first shaft (16) connected to the first central arm (18) mounting the first main roller (8) and forming a pivot point (G) of the second roller (14); there being second pressure means acting on the second roller (14) and used to adjust its position relative to the first roller (8) in accordance with the profile of the panel (1) so that it remains in contact with the edge band (4).
11. The device according to claim 7, **characterized in that** the means (10) for pressing and adjusting the position of the first roller (8) consist of the first connecting-rod (9) with a pair of toothed wheels (19, 20) at each end, of which one is securely keyed to the shaft that forms the main axis (Z); the toothed wheel (19, 20) having a first chain (21) looped around them; there being, at one branch (21a) of the chain (21), first drive means (22) connected to the first connecting-rod (9) and acting on the first branch in such a way as to allow the connecting-rod (9) to turn in both directions according to the profile of the edge (1b); said first connecting-rod (9) also having a central arm (18) extending transversally to the chain (21) and rotatably mounting at its free end the first main roller (8).
12. The device according to claim 10, **characterized in that** the second pressure and adjustment means (17) consist of a second connecting-rod (15) having, on the ends of it, corresponding second toothed wheels (24, 25) around which a second chain (26) is looped; the second toothed wheel (24) being securely keyed to the first shaft (16) and, at the other toothed wheel (25), there being second means (27) for driving the second connecting-rod (15), acting on the second chain (26) and designed to turn the second roller (14) relative to the position of the first roller (8) in both directions, in accordance with the profile of the edge (1b) and in such a way as to keep the second roller (14) in contact with the edge.
13. The device according to claims 1 to 5, **characterized in that** the glue feed means (7) consist of a glue pot (28) in a housing (29) made in the unit and located near the applicator roller (6); the glue pot (28) being equipped with a pair of spreader rollers (30) which turn freely about the corresponding vertical axes and located between the glue pot (28) and the glue applicator roller (6) so that they can uniformly spread glue on the outer surface of the roller (6).

14. The device according to claims 8 and 9, **characterized in that** the means (11) for feeding the edge band (4) comprise, within a supporting and covering structure (31), at least one pair of motor-driven rollers (32) used for loading the edge band (4) and fitted opposite each other in such a way as to move the continuous edge band (4) towards the edge (1b) in a feed direction (D); there being means (33) for detecting the passage of the edge band (4), located downstream of the pair of rollers (32) relative to the feed direction (D) and operating on related stop means (34) located upstream of the pair of rollers (32) relative to the feed direction (D) and designed to stop the feeding of the edge band (4) according to the position of the unit.
15. The device according to claim 14, **characterized in that** the means (33) for detecting the passage of the edge band (4) consist at least one pair of optical units (35) placed opposite each other.
16. The device according to claim 14, **characterized in that** the stop means (34) consist of a presser element (36) acting on a section of the edge band (4) being fed and a straight wall (37) against which the presser element (36) presses the edge band (4) to stop it.
17. The device according to claim 14, **characterized in that** the means (11) for feeding the edge band (4) comprise, downstream of the detecting means (33) relative to the feed direction (D), an arm (38) for guiding and spacing the edge band (4) from a glue applicator roller (6), positioned parallel to the edge band (4) and pivoted at one end, at (C), to the supporting structure (31); the arm (38) being equipped with drive means (39) designed to allow the arm to rotate at least between two limit positions, of which one is an idle position when no edge band (4) is detected and in which the arm (38) is away from a guide wall (40) of the edge band (4), and at least one working, feed position in which the arm (38) is close to the guide wall (40) and in contact with the edge band (4) being fed in such a way as to keep the latter on a defined feed line which does not interfere with the glue applicator roller (6).
18. The device according to claim 14, **characterized in that** the edge band (4) feed means (11) comprise means (41) for heating the edge band (4) located upstream of the stop means (34), relative to the feed direction (D), and designed to make the edge band more pliable when required.
19. The device according to claim 18, **characterized in that** the heating means (41) comprise one or more short-wave infrared ray emitting units (42) positioned parallel to each other and transversal to the direction of feed (D).
20. The device according to claim 11, **characterized in that** the central arm (18) is equipped with means (43) that lock it in a fixed position in which the first main roller (8) is away from the edge (1b) of the panel (1) when a contact roller (6) comes into contact with the panel edge.
21. The device according to claim 20, **characterized in that** the locking means (43) comprise a vertical pin (44) connected with the central arm (18) and which can move along its vertical axis between a lowered, idle position in which the central arm (18) is able to move, allowing the first main roller (8) to come into contact with the edge (1b), and a raised, working position in which the pin (44) is in contact with a wall (45) attached to a fixed structure (46) of the device in such a way as to determine said fixed position; the fixed wall (45) having a set screw (47) that can be placed opposite the pin (44) in order to vary the position in which the central arm (18) stops relative to the set screw so as to adjust the distance between the first roller (8) and the edge (1b) in the fixed position.
22. The device according to claim 7, **characterized in that** the first main pressure roller (8) of the edge band (4) is mounted in such a way that it can turn freely on a first shaft (101) mounted at the free end of the central arm (18) of the first connecting-rod (9); there being, on the ends of the shaft (101), corresponding first rubber rings (102, 103) designed to provide the first shaft (101) and the first roller (8) with axial flexibility so that they can adjust to different shapes when they come into contact with the band (4) applied to the edge (1b).
23. The device according to claim 10, **characterized in that** the second pressure roller (14) of the edge band (4) is mounted in such a way that it can turn freely on a second shaft (105) mounted on the second connecting-rod (15); there being, on the ends of the second shaft (105), corresponding second rubber rings (106, 107), said second rubber rings (106, 107) being designed to provide the second shaft (105) and the second roller (14) with axial flexibility so that they can adjust to different shapes when they come into contact with the band (4) applied to the edge (1b).
24. The device according to claims 22 and 23, **characterized in that** the first and second shafts (101, 105) of the corresponding first and second rollers (8, 14) are rigidly connected to each other at their lower ends by a single supporting element (104) having a vertical column (108) connected to the second connecting-rod (15).

25. The device according to claim 6, **characterized in that** it comprises a guide element (40), located close to the contact roller (6), said guide element (40) consisting of a blade (109) mounted on a rod (110) which slides axially between an idle position, in which the blade (109) is away from the contact roller (6) and a working position in which the blade (109) is close to the glue application means (100) and opposes the edge band (4), on the side opposite that on which the glue is applied.
26. The device according to claims 8 and 9, **characterized in that** the edge band (4) feed means (11) and the glue feed means (7) are equipped with means (110) for adjusting their position, that is to say, tilting them about the main axis (Z) according to the profile of the panel (1).
27. The device according to claim 26, **characterized in that** the adjustment means (110) consist of the a structure (31) that supports and covers the edge band feed means (11) and the glue feed means (7) and that is free to turn about the main axis (Z), the top of the structure (31) being equipped with a linear guide (111) that is slidably coupled to a counter-guide (112) made on a main mounting plate (113) that is rotatably connected to the shaft forming the main axis (Z); the main mounting plate (113) comprising means (114) that drive it and the supporting structure (31) and that are designed to enable the plate (113) and the supporting structure (31) to tilt about the main axis (Z) in both directions.
28. The device according to claims 1, 3 and 4, **characterized in that** the suspension elements (200) are located between the main mounting plate (113), connected to the shaft forming the main axis (Z), and a covering structure (31) that houses the feed means (7) and the edge band feed means (11).
29. The device according to claim 28, **characterized in that** the suspension means (200) consist of three separate pairs of connecting-rods (201, 202, 203) located between the mounting plate (113) and the covering structure (31) and linked to them at corresponding limit points; the connecting-rods (201, 202, 203) being also connected to each other at corresponding intermediate points by a rigid, substantially Y-shaped element (204).
30. The device according to claim 28, **characterized in that** it comprises means (205, 206) located between the main plate (113) and the covering structure (31) and used for controlling the position of the covering structure (31) relative to the main axis (Z), that is to say, relative to the profile of the edge (1b) of the panel (1).
31. The device according to claim 28, **characterized in that** the position control means consist of a pair of cylinders (205, 206) fitted at right angles to each other and linked to the covering structure (31), at one end, and to a single vertical reference pin (207) with the corresponding stem; the vertical pin (207) being lined up with an opening (208) made in the main plate (113) and on the other side of which there is an inductive sensor (209) housed in the plate (113) and designed to detect the presence of the pin (207) at the opening (208) and to stop the entire device when the pin (207) moves away from the opening (208) to indicate that the covering structure (31) is in the wrong position relative to the profile of the edge (1b).
32. The device according to claims 8 and 9, **characterized in that** the edge band feed means (11) comprise a carriage (210) designed to guide and carry the edge band (4) close to the edge (1b) at the start of the work cycle and equipped with a fixed base (211) and a pair of arms (212, 213) placed opposite the base (211) in such a way as to form a channel for the passage of the edge band; there being a cylinder (214) acting on the carriage (210), the cylinder (214) being connected to the covering structure (31) and designed to drive the carriage (210) from a retracted, idle position to a forward, working position in which it carries the edge band (4) close to the edge (1b).
33. The device according to claim 32, **characterized in that** the stem of the cylinder (214) is connected to the end of the arm (212), which is L-shaped and pivoted at (F212) to the body of the carriage (210) in such a way as to allow a portion of the edge band (4) to be rotated to a stop position during the passage from the retracted to the forward position, under the thrusting action of the cylinder (214), and then to rotate the edge band (4) to a released position in the opposite direction when it is applied to the edge (1b), said release being effected by further moving forward only the carriage (210) while keeping the stem fixed.
34. The device according to claims 8 and 9, **characterized in that** edge band feed means (11) comprise an arm (215) that applies glue to the edge band (4), this arm (215) being equipped with a counter roller (216) at its free end and a cylinder (217) that drives it from an idle position, in which it is away from the glue applicator roller (6) and a working position in which it is close to the glue applicator roller (6), with the edge band (4) between the roller (6) and the counter roller (216).
35. The device according to claims 8, 9 and 14, **characterized in that** the two rollers (32) that feed and



load the edge band (4) have corresponding kinematic elements (218) which enable them to rotate in the feed direction (D) independently of the direction of rotation of the glue applicator roller (6).

36. The device according to claims 14 and 35, **characterized in that** the kinematic elements (218) consist of a pair of first toothed wheels (218a, 218b) keyed to a single rotating shaft (219) connected to the feed rollers (32), said first toothed wheels (218a, 218b) being housed at the top of the covering structure (31) of the edge band feed means (11); each of the two first toothed wheels (218a, 218b) meshing with corresponding second toothed wheels (220, 221) which are linked to the drive elements (222) of the device, are connected to the shaft forming the main axis (Z), and are driven in opposite directions of rotation; each of the first toothed wheels (218a, 218b) being equipped with free wheel means (218c) designed to enable it to turn freely on the shaft (219) when the shaft forming the main axis (Z) turns in the direction opposite to its own.
37. The device according to claims 8 and 9, **characterized in that** the edge band feed means (11) comprise means (223) for detecting the length of the edge band (4) and cutting off the edge band (4) when it has gone right around the panel to join the starting end (4a) that was applied first.
38. The device according to claims 8, 9, 14 and 37, **characterized in that** the detecting means (223) consist of a rod (224) pivoted at (F224) to the covering structure (31) and designed to rotate between an idle position in which it is withdrawn inside the covering structure (31), and a working position in which it protrudes from the structure when necessary and is positioned close to the edge (1b), with a part in contact with the lower surface of the panel (1) to be edge banded; the rod (224) being equipped with presence sensors (225, 226) located opposite each other and designed to detect the starting end (4a) of the edge band (4) and to send a signal to the control unit (50) which processes the signal and activates a cutoff unit (227) located close to the channel (12) for the passage of the edge band (4).
39. The device according to claim 38, **characterized in that** the cutoff unit (227) consists of a circular cutter (228) mounted on a base (229) that is slidably connected to the covering structure (31) and linked to a drive cylinder (230).
40. The device according to claim 13, **characterized in that** the two glue spreader rollers (30) are equipped with independent drive means (231) to open and close them; the drive means (231) consisting of a vertical shaft (232, 233) to connect each cylinder

(30), each shaft (232, 233) being equipped with a rod (234), perpendicular to it and acted upon by cam means (235) which are in turn acted upon by drive means (236) in such a way as to open one spreader roller (30) and close the other and vice versa.

41. The device according to claim 40, **characterized in that** the two rods (234) have spring means (237) designed to keep them apart so as to keep the corresponding spreader rollers (30) closed when the drive means (236) are in the idle position.
42. The device according to claim 40, **characterized in that** the cam means (235) consist of a tubular carriage (238) within which the shafts (232, 233) can be partly housed, each shaft having a cam follower pin (239) placed in contact with the corresponding cam profiles (240) made on a wall of the carriage (238) so that, when the drive means (236), consisting of a pneumatic cylinder connected to the carriage (238) are activated, one or other of the spreader rollers (30) is opened.
43. The device according to claim 11, **characterized in that** the first pressure roller (8) can slide along the central supporting arm (18) so that its axis of rotation moves away from the main axis (Z) in order to prevent said first roller from jamming on the edge (1b) of the panel (1).
44. The device according to claims 11 and 43, **characterized in that** the first roller (8) slides on a first guide (241) and, at the top of it, has a cam profile (242) that acts on a cam follower roller (243) connected to an element (244) used to regulate the pressure exerted by the first pressure means (10) so as to adjust the position of the first roller (8) and to reduce the pressure of the first roller (8) on the edge (1b) when the roller moves away from the main axis (Z); means (245) being envisaged to act on the first pressure means (10) so as to restore initial working conditions.
45. The device according to claim 12, **characterized in that** the second pressure roller (14) slides along the central arm (18) so that its axis of rotation moves away from the main axis (Z) and the first pressure roller (8) in order to prevent said second roller from jamming on the edge (1b) of the panel (1).
46. The device according to claim 45, **characterized in that** the second roller (14) slides on a second guide (246) located on the central arm (18) and, at the top of it, has a cam profile (247) that acts on a cam follower roller (248) connected to regulator valve means (249) used to reduce the pressure exerted by second pressure means (17) acting on the second roller (14) in such a way as to reduce its pres-

sure on the edge (1b); spring means (250) acting between the second roller (14) and the central arm (18) in order to restore initial working conditions.

#### Patentansprüche

1. Vorrichtung zum Anbringen von Umleimern an Platten (1), insbesondere an Platten, welche unterschiedlich geformte Profile haben, und welche auf Maschinen verarbeitet werden können, die wenigstens einen Arbeitstisch (2) aufweisen, auf welchem die Platte (1) festgehalten wird, sowie Anbringungsmittel (3) zum Verkleben eines Umleimers (4) an einer Kante (1b), wobei die Vorrichtung die Anbringungsmittel (3) und den Arbeitstisch (2) enthält, die in der Lage sind, sich im Verhältnis zueinander zu bewegen, wobei die genannte Vorrichtung **dadurch gekennzeichnet ist, dass** die Anbringungsmittel (3) zum Anbringen des Umleimers (4) aus einer Einheit mit einer angetriebenen Welle bestehen, welche eine vertikale Hauptachse (Z) bildet und die folgenden Elemente trägt und antreibt:
  - eine Kontaktrolle (6) für die Kante (1b) der Platte (1), die sich frei um ihre vertikale Achse drehen kann, welche mit der Hauptachse (Z) übereinstimmt;
  - Mittel (7) zum Zuführen von Kleber; und
  - wenigstens eine erste Hauptpressrolle (8), welche auf den Umleimer (4) drückt, wobei die genannten Mittel (7) und die Pressrolle (8) auf entgegengesetzten Seiten der Kontaktrolle (6) angeordnet und in der Lage sind, übereinstimmend mit dem Profil der Platte (1) um die Hauptachse (Z) zu schwingen.
2. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** die Zuführmittel (7) für den Kleber und die Hauptpressrolle (8) mit der die Hauptachse (Z) bildenden Welle auf solche Weise verbunden sind, dass sie um die Achse (Z) schwenken können, um so dem Profil der Platte (1) zu folgen.
3. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** die Zuführmittel (7) für den Kleber mit der die Hauptachse (Z) bildenden Welle auf solche Weise verbunden sind, dass sie sich in einer geraden Linie bewegen und somit dem Profil der Platte (1) folgen können.
4. Vorrichtung nach Patentanspruch 3, **dadurch gekennzeichnet, dass** die Zuführmittel (7) für den Kleber mit der die Hauptachse (Z) bildenden Welle durch Aufhängeelemente (200) verbunden sind, bestimmt sie zu befähigen, in einer geraden Linie zu schwingen, und zwar mit einer wirbelfreien Be-

wegung auf einer Ebene und entlang von zwei lotrecht zu der Hauptachse (Z) verlaufenden Achsen.

5. Vorrichtung nach den Patentansprüchen von 1 bis 4, **dadurch gekennzeichnet, dass** die Rolle (6) eine Rolle ist, welche den Kleber auf die Kante (1b) aufträgt, und die an die Zuführmittel (7) für den Kleber angeschlossen ist, welche den Kleber auf die Rolle (6) streichen.
6. Vorrichtung nach den Patentansprüchen von 1 bis 4, **dadurch gekennzeichnet, dass** die Rolle (6) eine Kontaktrolle für die Kante (1b) ist, und dass Mittel (100) zum Auftragen des Klebers direkt auf den Umleimer (4) vorhanden sind.
7. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** die erste Hauptpressrolle (8) für den Umleimer (4) stromabwärts der Kontaktrolle (6) im Verhältnis zu der Richtung (B), in welcher der Umleimer (4) angebracht wird, angeordnet ist, sich frei um ihre vertikale Achse drehen kann und an eine erste Pleuelstange (9) angeschlossen ist, welche wiederum mit einem Ende an die die Hauptachse (Z) bildende Welle angelenkt ist; wobei die erste Pleuelstange (9) an erste Mittel (10) zum Pressen der ersten Rolle (8) gegen die Kante (1b) und gleichzeitig zum Einstellen der Winkelposition der Rolle im Verhältnis zu der Position der Kontaktrolle (6) angeschlossen ist, und zwar je nach dem Profil der Kante (1b) der Platte (1) und auf solche Weise, dass die erste Rolle (8) gegen den Umleimer (4) gedrückt gehalten wird.
8. Vorrichtung nach den Patentansprüchen von 1 bis 4, **dadurch gekennzeichnet, dass** sie Mittel (11) zum Zuführen des Umleimers (4) in Richtung der Kante (1b) der Platte (1) enthält, die dicht an der Kontaktrolle (6) angeordnet und in der Lage sind, zusammen mit den Zuführmitteln (7) für den Kleber um die Hauptachse (Z) zu schwingen, je nach dem Profil der Platte (1).
9. Vorrichtung nach den Patentansprüchen von 1 bis 5, **dadurch gekennzeichnet, dass** sie Mittel (11) zum Zuführen des Umleimers (4) in Richtung der Kante (1b) der Platte (1) enthält, die dicht an der Auftragerolle (6) des Klebers angeordnet und in der Lage sind, zusammen mit den Zuführmitteln (7) für den Kleber um die Hauptachse (Z) zu schwingen, je nach dem Profil der Platte (1); wobei die genannten Zuführmittel (11) des Umleimers (4) auf solche Weise ausgelegt sind, dass sie einen Kanal (12) bilden, durch welchen der Umleimer (4), wenn erforderlich, der Kante (1b) in einem Bereich (13) zugeführt wird, der sich zwischen der Auftragerolle (6) des Klebers und der ersten Hauptpressrolle (8) befindet.

10. Vorrichtung nach Patentanspruch 1, **dadurch gekennzeichnet, dass** sie eine sekundäre Pressrolle (14) enthält, angeordnet stromabwärts der ersten Hauptrolle (8) im Verhältnis zu der Richtung (B), in welcher der Umleimer (4) angebracht wird, und angeschlossen an eine zweite Pleuelstange (15), die mit einem Ende an eine erste Welle (16) angelenkt ist, letztere an den ersten mittleren Arm (18) angeschlossen, der die erste Hauptrolle (8) trägt und einen Drehpunkt (G) der zweiten Rolle (14) bildet; wobei zweite Pressmittel vorhanden sind, die auf die zweite Rolle (14) wirken und dazu benutzt werden, deren Position im Verhältnis zu der ersten Rolle (8) je nach dem Profil der Platte (1) zu regulieren, so dass sie im Kontakt mit dem Umleimer (4) bleibt.
11. Vorrichtung nach Patentanspruch 7, **dadurch gekennzeichnet, dass** die Mittel (10) zum Pressen und Regulieren der Position der ersten Rolle (8) aus der ersten Pleuelstange (9) bestehen, versehen an jedem Ende mit einem Paar von Zahnrädern (19, 20), von denen eins fest auf die Welle aufgezogen ist, welche die Hauptachse (Z) bildet; wobei um die Zahnräder (19, 20) eine erste, ringförmig geschlossene Kette (21) gewunden ist; wobei an einem Abschnitt (21a) der Kette (21) erste Antriebsmittel (22) vorhanden sind, angeschlossen an die erste Pleuelstange (9) und auf den ersten Abschnitt auf solche Weise wirkend, dass sich die Pleuelstange (9) in beiden Richtungen je nach dem Profil der Kante (1b) drehen kann; wobei die genannte erste Pleuelstange (9) ebenfalls einen mittleren Arm (18) aufweist, der sich quer zu der Kette (21) erstreckt und an seinem freien Ende drehbar die erste Hauptrolle (8) trägt.
12. Vorrichtung nach Patentanspruch 10, **dadurch gekennzeichnet, dass** die zweiten Press- und Reguliermittel (17) aus einer zweiten Pleuelstange (15) bestehen, die an ihren Enden entsprechende zweite Zahnräder (24, 25) hat, um welche eine zweite Kette (26) gewunden ist; wobei das zweite Zahnrad (24) fest auf die erste Welle (16) aufgezogen ist und an dem anderen Zahnrad (25) zweite Mittel (27) für den Antrieb der zweiten Pleuelstange (15) vorhanden sind, die auf die zweite Kette (26) wirken und dazu dienen, die zweite Rolle (14) im Verhältnis zu der Position der ersten Rolle (8) in beiden Richtungen zu drehen, je nach dem Profil der Kante (1b) und auf solche Weise, dass die Rolle (14) im Kontakt mit der Kante gehalten wird.
13. Vorrichtung nach den Patentansprüchen von 1 bis 5, **dadurch gekennzeichnet, dass** die Zuführmittel (7) für den Kleber aus einem Kleberbehälter (28) besteht, angeordnet in einem Sitz (29), welcher in die Einheit eingearbeitet ist und sich dicht an der Auftragerolle (6) befindet; wobei der Kleberbehälter (28) mit einem Paar von Streichrollen (30) ausgestattet ist, welche sich frei um die entsprechenden vertikalen Achsen drehen und zwischen dem Kleberbehälter (28) und der Auftragerolle (6) des Klebers angeordnet sind, so dass sie den Kleber gleichmässig auf die äussere Oberfläche der Rolle (6) streichen können.
14. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet, dass** die Mittel (11) zum Zuführen des Umleimers (4) innerhalb einer Träger- und Abdeckstruktur (31) wenigstens ein Paar von angetriebenen Rollen (32) enthalten, benutzt zum Laden des Umleimers (4) und sich gegenüberliegend auf solche Weise angebracht, dass sie den kontinuierlichen Umleimer (4) in einer Zuführrichtung (D) zu der Kante (1b) leiten; wobei Mittel (33) zum Erfassen des Durchlaufs des Umleimers (4) vorhanden sind, angeordnet stromabwärts von dem Paar von Rollen (32) im Verhältnis zu der Zuführrichtung (D) und auf entsprechende Arretiermittel (34) wirkend, die sich im Verhältnis zu der Zuführrichtung (D) stromaufwärts des Paares von Rollen (32) befinden und dazu bestimmt sind, das Zuführen des Umleimers (4) je nach der Position der Einheit zu stoppen.
15. Vorrichtung nach Patentanspruch 14, **dadurch gekennzeichnet, dass** die Mittel (33) zum Erfassen des Durchlaufs des Umleimers (4) aus wenigstens einem Paar von optischen Vorrichtungen (35) bestehen, die sich gegenüberliegend angeordnet sind.
16. Vorrichtung nach Patentanspruch 14, **dadurch gekennzeichnet, dass** die Arretiermittel (34) aus einem Presselement (36) bestehen, welches auf einen Abschnitt des vorlaufenden Umleimers (4) wirkt, und aus einer geraden Wand (37), gegen welche das Presselement (36) den Umleimer (4) drückt, um ihn anzuhalten.
17. Vorrichtung nach Patentanspruch 14, **dadurch gekennzeichnet, dass** die Mittel (11) zum Zuführen des Umleimers (4) stromabwärts der Erfassungsmittel (33) im Verhältnis zu der Zuführrichtung (D) einen Arm (38) enthalten, der zum Führen des Umleimers (4) und zum Halten desselben auf Abstand von einer Auftragerolle (6) des Klebers dient, positioniert parallel zu dem Umleimer (4) und angelenkt mit einem Ende in (C) an die Trägerstruktur (31); wobei der Arm (38) mit Antriebsmitteln (39) versehen ist, die es dem Arm erlauben, sich wenigstens zwischen zwei Grenzpositionen zu drehen, von welchen eine die Ruhestellung ist, wenn kein Umleimer (4) erfasst und in welcher der Arm (38) von einer Führungswand (40) des Umleimers (4) entfernt ist, und wenigstens eine Arbeits- oder Zuführposition,

in welcher der Arm (38) dicht an der Führungswand (40) liegt und auf solche Weise im Kontakt mit dem vorlaufenden Umleimer (4) ist, dass letzterer auf einer bestimmten Vorlaufbahn gehalten wird, welche nicht die Auftragerolle (6) des Klebers behindert.

18. Vorrichtung nach Patentanspruch 14, **dadurch gekennzeichnet, dass** die Zuführrmittel (11) des Umleimers (4) Mittel (41) zum Erwärmen des Umleimers (4) enthalten, die im Verhältnis zu der Zuführ-  
richtung (D) stromaufwärts der Arretiemittel (34) angeordnet und dazu bestimmt sind, den Umleimer, falls erforderlich, geschmeidiger zu machen.
19. Vorrichtung nach Patentanspruch 18, **dadurch gekennzeichnet, dass** die Heizmittel (41) eine oder mehr Emissionseinheiten (42) von Kurzwellen-Infrarotstrahlen enthalten, die parallel zueinander und quer zu der Zuführ-  
richtung (D) angeordnet sind.
20. Vorrichtung nach Patentanspruch 11, **dadurch gekennzeichnet, dass** der mittlere Arm (18) mit Mitteln (43) versehen ist, die ihn in einer festen Position blockieren, in welcher die erste Hauptrolle (8) von der Kante (1b) der Platte (1) entfernt ist, wenn eine Kontaktrolle (6) mit der Plattenkante in Kontakt kommt.
21. Vorrichtung nach Patentanspruch 20, **dadurch gekennzeichnet, dass** die Blockierrmittel (43) einen vertikalen Zapfen (44) enthalten, der mit dem mittleren Arm (18) verbunden ist und sich entlang seiner vertikalen Achse verschieben kann, und zwar zwischen einer unteren Ruhestellung, in welcher sich der mittlere Arm (18) bewegen kann und es der ersten Hauptrolle (8) erlaubt, mit der Kante (1b) in Kontakt zu kommen, und einer angehoben Arbeitsposition, in welcher sich der Zapfen (44) im Kontakt mit einer Wand (45) befindet, die an einer festen Struktur (46) der Vorrichtung auf solche Weise angebracht ist, dass die genannte feststehende Position bestimmt wird; wobei die feststehende Wand (45) eine Stellschraube (47) aufweist, die gegenüber dem Zapfen (44) eingesetzt werden kann, um die Position zu verändern, in welcher der mittlere Arm (18) im Verhältnis zu der Stellschraube anschlägt, so dass der Abstand zwischen der ersten Rolle (8) und der Kante (1b) in der festen Position reguliert werden kann.
22. Vorrichtung nach Patentanspruch 7, **dadurch gekennzeichnet, dass** die erste Hauptpressrolle (8) des Umleimers (4) auf solche Weise montiert ist, dass sie sich frei auf einer ersten Welle (101) drehen kann, die an dem freien Ende des mittleren Arms (18) der ersten Pleuelstange (9) angebracht ist; wobei an den Enden der Welle (101) entspre-

chende erste Gummiringe (102, 103) vorhanden sind, dazu bestimmt, die erste Welle (101) und die erste Rolle (8) mit einer Flexibilität zu versehen, so dass sie sich den verschiedenen Formen anpassen können, wenn sie in Kontakt mit dem an der Kante (1b) angebrachten Umleimer (4) kommen.

23. Vorrichtung nach Patentanspruch 10, **dadurch gekennzeichnet, dass** die zweite Pressrolle (14) des Umleimers (4) auf solche Weise montiert ist, dass sie sich frei auf einer zweiten Welle (105) drehen kann, die an der zweiten Pleuelstange (15) angebracht ist; wobei an den Enden der zweiten Welle (105) entsprechende zweite Gummiringe (106, 107) vorhanden sind, wobei die genannten zweiten Gummiringe (106, 107) dazu bestimmt sind, die zweite Welle (105) und die zweite Rolle (14) mit einer Flexibilität zu versehen, so dass sie sich den verschiedenen Formen anpassen können, wenn sie in Kontakt mit dem an der Kante (1b) angebrachten Umleimer (4) kommen.
24. Vorrichtung nach den Patentansprüchen 22 und 23, **dadurch gekennzeichnet, dass** die ersten und zweiten Wellen (101, 105) der entsprechenden ersten und zweiten Rollen (8, 14) an ihren unteren Enden starr miteinander verbunden sind, und zwar durch ein einziges Trägerelement (104) mit einer vertikalen Säule (108), die an die zweite Pleuelstange (15) angeschlossen ist.
25. Vorrichtung nach Patentanspruch 6, **dadurch gekennzeichnet, dass** sie ein Führungselement (40) enthält, angeordnet dicht an der Kontaktrolle (6), wobei das genannte Führungselement (40) aus einem an einer Stange (110) montierten Blatt (109) besteht, welches axial zwischen einer Ruhestellung, in welcher das Blatt (109) von der Kontaktrolle (6) entfernt ist, und einer Arbeitsposition gleitet, in welcher das Blatt (109) dicht an den Auftragemitteln (100) des Klebers liegt und dem Umleimer (4) auf der entgegengesetzten Seite von der, auf welche der Kleber aufgetragen ist, entgegen wirkt.
26. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet, dass** die Zuführrmittel (11) des Umleimers (4) und die Zuführrmittel (7) des Klebers mit Mitteln (110) zum Regulieren ihrer Position versehen sind, das heisst zum Schwenken derselben um die Hauptachse (Z) je nach dem Profil der Platte (1).
27. Vorrichtung nach Patentanspruch 26, **dadurch gekennzeichnet, dass** die Reguliermittel (110) aus einer Struktur (31) bestehen, welche die Zuführrmittel (11) des Umleimers und die Zuführrmittel (7) des Klebers trägt und abdeckt, und dass sie frei ist, sich um die Hauptachse (Z) zu drehen, wobei der obere

- Teil der Struktur (31) mit einer linearen Führung (111) versehen ist, gleitbar verbunden mit einer Gegenführung (112) an einer Hauptmontageplatte (113), welche drehbar mit der die Hauptachse (Z) bildenden Welle verbunden ist; wobei die Hauptmontageplatte (113) Mittel (114) enthält, welche diese und die genannte Trägerstruktur (31) betätigen, und die dazu bestimmt sind, das Schwenken der Platte (113) und der Trägerstruktur (31) um die Hauptachse (Z) in beiden Richtungen zu erlauben.
28. Vorrichtung nach den Patentansprüchen 1, 3 und 4, **dadurch gekennzeichnet**, dass die Aufhängeelemente (200) zwischen der Hauptmontageplatte (113), die mit der die Hauptachse (Z) bildenden Welle verbunden ist, und einer Abdeckstruktur (31), welche die Zuführmittel (7) und die Zuführmittel (11) des Umleimers aufnimmt, angeordnet sind.
29. Vorrichtung nach Patentanspruch 28, **dadurch gekennzeichnet**, dass die Aufhängeelemente (200) aus drei getrennten Paaren von Pleuelstangen (201, 202, 203) bestehen, angeordnet zwischen der Montageplatte (113) und der Abdeckstruktur (31) und an diese an entsprechenden Grenzpunkten angeschlossen; wobei die Pleuelstangen (201, 202, 203) ebenfalls an entsprechenden Zwischenpunkten durch ein starres, im wesentlichen Y-förmiges Element (204) miteinander verbunden sind.
30. Vorrichtung nach Patentanspruch 28, **dadurch gekennzeichnet**, dass sie Mittel (205, 206) enthält, angeordnet zwischen der Hauptplatte (113) und der Abdeckstruktur (31) und benutzt zum Steuern der Position der Abdeckstruktur (31) im Verhältnis zu der Hauptachse (Z), das heisst im Verhältnis zu dem Profil der Kante (1b) der Platte (1).
31. Vorrichtung nach Patentanspruch 28, **dadurch gekennzeichnet**, dass die Mittel zum Steuern der Position aus einem Paar von Zylindern (205, 206) bestehen, angeordnet im rechten Winkel zueinander und an der Abdeckstruktur (31) an einem Ende mit dem entsprechenden Schaft an einem einzigen vertikalen Bezugzapfen (207) befestigt; wobei der vertikale Zapfen (207) zu einer Öffnung (208) ausgerichtet ist, die sich in der Hauptplatte (113) befindet, und auf deren anderer Seite ein induktiver Fühler (209) vorhanden ist, aufgenommen in der Platte (113) und dazu bestimmt, das Vorhandensein des Zapfens (207) an der Öffnung (208) zu erfassen und die gesamte Vorrichtung anzuhalten, wenn sich der Zapfen (207) von der Öffnung (208) fort bewegt, um anzuzeigen, dass sich die Abdeckstruktur (31) in der falschen Position im Verhältnis zu dem Profil der Kante (1b) befindet.
32. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet**, dass die Zuführmittel (11) für den Umleimer einen Schlitten (210) enthalten, dazu bestimmt, den Umleimer (4) bei Beginn des Arbeitszyklus dicht an der Kante (1b) zu führen und zu halten, und der mit einer feststehenden Basis (211) und einem Paar von Armen (212, 213) versehen ist, die auf solche Weise der Basis (211) gegenüberliegend angeordnet sind, dass ein Kanal für den Durchlass des Umleimers gebildet wird; wobei ein auf den Schlitten (210) wirkender Zylinder (214) vorhanden ist, und wobei der Zylinder (214) an die Abdeckstruktur (31) angeschlossen und dazu bestimmt ist, den Schlitten (210) aus einer zurückgezogenen Ruhestellung in eine vorgeschobene Arbeitsposition zu verschieben, in welcher er den Umleimer (4) dicht an die Kante (1b) führt.
33. Vorrichtung nach Patentanspruch 32, **dadurch gekennzeichnet**, dass der Schaft des Zylinders (214) an das Ende des Armes (212) angeschlossen ist, welcher L-förmig ausgebildet und in (F212) an den Körper des Schlittens (210) angelenkt ist, und zwar auf solche Weise, dass ein Abschnitt des Umleimers (4) während des Übergangs aus der zurückgezogenen Position in die vorgeschobene Position und unter der Schubwirkung des Zylinders (214) in eine Blockierposition gedreht werden kann, und dann der Umleimer (4) in der entgegengesetzten Richtung in eine Freigabeposition gedreht werden kann, wenn er an der Kante (1b) angebracht ist, wobei die genannte Freigabe durch eine weitere Vorwärtsbewegung nur des Schlittens (210) erfolgt, während der Schaft festgehalten wird.
34. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet**, dass die Zuführmittel (11) für den Umleimer einen Arm (215) enthalten, welcher den Kleber auf den Umleimer (4) aufträgt, wobei dieser Arm (215) mit einer Gegenrolle (216) an seinem freien Ende und mit einem Zylinder (217) versehen ist, der ihn aus einer Ruhestellung, in welcher er von der Auftragerolle (6) des Klebers entfernt ist, in eine Arbeitsposition, in welcher er dicht an der Auftragerolle (6) des Klebers ist, bewegt, und zwar mit dem Umleimer (4) zwischen der Rolle (6) und der Gegenrolle (216).
35. Vorrichtung nach den Patentansprüchen 8, 9 und 14, **dadurch gekennzeichnet**, dass die beiden Rollen (32), welche den Umleimer (4) zuführen und laden, entsprechende kinematische Elemente (218) aufweisen, welche sie befähigen, sich in der Zuführrichtung (D) unabhängig von der Drehrichtung der Auftragerolle (6) des Klebers zu drehen.
36. Vorrichtung nach den Patentansprüchen 14 und 35, **dadurch gekennzeichnet**, dass die kinematischen Elemente (218) aus einem Paar von ersten

- Zahnradern (218a, 218b) bestehen, aufgezogen auf eine einzige drehende Welle (219), die an die Zuführrollen (32) angeschlossen ist, wobei die genannten ersten Zahnräder (218a, 218b) im oberen Teil der Abdeckstruktur (31) der Zuführmittel (11) für den Umleimer angeordnet sind; wobei jedes der beiden ersten Zahnräder (218a, 218b) in entsprechende zweite Zahnräder (220, 221) greift, welche an die Antriebselemente (222) der Vorrichtung angeschlossen und mit der die Hauptachse (Z) bildenden Welle verbunden sind, und die in entgegengesetzten Drehrichtungen in Umdrehung versetzt werden; wobei jedes der ersten Zahnräder (218a, 218b) mit Freilaufmitteln (218c) ausgestattet ist, die es befähigen, sich frei auf der Welle (219) zu drehen, wenn die die Hauptachse (Z) bildende Welle sich in entgegengesetzter Richtung zu ihrer eigenen dreht.
37. Vorrichtung nach den Patentansprüchen 8 und 9, **dadurch gekennzeichnet, dass** die Zuführmittel (11) für den Umleimer Mittel (223) zum Erfassen der Länge des Umleimers (4) enthalten und den Umleimer (4) abschneiden, wenn dieser um die Platte herum geführt worden ist und das Anfangsstück (4a) erreicht hat, das zuerst angebracht worden ist.
38. Vorrichtung nach den Patentansprüchen 8, 9, 14 und 37, **dadurch gekennzeichnet, dass** die Erfassungsmittel (223) aus einer Leiste (224) bestehen, angelenkt in (F224) an die Abdeckstruktur (31) und dazu bestimmt, sich zwischen einer Ruhestellung, in welcher sie in die Abdeckstruktur (31) hineingezogen ist, und einer Arbeitsposition zu drehen, in welcher sie, wenn erforderlich, aus der Struktur herausragt und dicht an der Kante (1b) angeordnet ist, und zwar mit einem Teil im Kontakt mit der unteren Oberfläche der zu umleimenden Platte (1); wobei die Leiste (224) mit Abtastfühlern (225, 226) versehen ist, die einander gegenüberliegend angeordnet und dazu bestimmt sind, das Anfangsstück (4a) des Umleimers (4) zu erfassen und ein Signal an die Steuereinheit (50) auszusenden, welche das Signal verarbeitet und eine Schneideinheit (227) aktiviert, die dicht an dem Kanal (12) für den Durchlauf des Umleimers (4) angeordnet ist.
39. Vorrichtung nach Patentanspruch 38, **dadurch gekennzeichnet, dass** die Schneideinheit (227) aus einem kreisförmigen Messer (228) besteht, montiert an einer Basis (229), die gleitbar mit der Abdeckstruktur (31) verbunden und an einen Antriebszylinder (230) angeschlossen ist.
40. Vorrichtung nach Patentanspruch 13, **dadurch gekennzeichnet, dass** die Streichrollen (30) für den Kleber mit unabhängigen Antriebsmitteln (231) zum Öffnen und Schliessen derselben versehen sind; wobei die Antriebsmittel (231) aus einer vertikalen Welle (232, 233) zum Anschliessen jeder Rolle (30) bestehen, und wobei jede Welle (232, 233) mit einer Stange (234) versehen ist, lotrecht angeordnet und durch Nockenmittel (235) auf diese wirkend, welche wiederum durch Antriebsmittel (236) auf solche Weise ausgelöst werden, dass eine Streichrolle (30) geöffnet und die andere geschlossen wird und umgekehrt.
41. Vorrichtung nach Patentanspruch 40, **dadurch gekennzeichnet, dass** die beiden Stangen (234) Federmittel (237) enthalten, die dazu bestimmt sind, sie auseinander zu halten, so dass die entsprechenden Streichrollen (30) geschlossen gehalten werden, wenn sich die Antriebsmittel (236) in der Ruhestellung befinden.
42. Vorrichtung nach Patentanspruch 40, **dadurch gekennzeichnet, dass** die Nockenmittel (235) aus einem rohrförmigen Schlitten (238) bestehen, in welchem die Wellen (232, 233) teilweise aufgenommen sind, wobei jede Welle einen Nockenstößelzapfen (239) enthält, im Kontakt mit den entsprechenden Nockenprofilen (240) angeordnet, die in eine Wand des Schlittens (238) eingearbeitet sind, so dass, wenn die aus einem an den Schlitten (238) angeschlossenen Druckluftzylinder bestehenden Antriebsmittel (236) aktiviert sind, die eine oder die andere der Streichrollen (30) geöffnet wird.
43. Vorrichtung nach Patentanspruch 11, **dadurch gekennzeichnet, dass** die erste Pressrolle (8) entlang dem mittleren Tragarm (18) gleiten kann, so dass sich ihre Drehachse von der Hauptachse (Z) fort bewegt, um die genannte erste Rolle daran zu hindern, sich an der Kante (1b) der Platte (1) zu verklemmen.
44. Vorrichtung nach den Patentansprüchen 11 und 43, **dadurch gekennzeichnet, dass** die erste Rolle (8) an einer ersten Führung (241) gleitet und oben ein Nockenprofil (242) aufweist, das auf eine Nockenstößelrolle (243) wirkt, angeschlossen an ein Element (244) zum Regulieren des durch die ersten Pressmittel (10) ausgeübten Druckes, um so die Position der ersten Rolle (8) zu regulieren und den Druck der ersten Rolle (8) auf die Kante (1b) zu reduzieren, wenn die Rolle sich von der Hauptachse (Z) fort bewegt; wobei Mittel (245) vorgesehen sind, die auf die ersten Pressmittel (10) wirken, um die anfänglichen Betriebsbedingungen wiederherzustellen.
45. Vorrichtung nach Patentanspruch 12, **dadurch gekennzeichnet, dass** die zweite Pressrolle (14) an dem mittleren Arm (18) entlang gleitet, so dass ihre Drehachse sich von der Hauptachse (Z) und der er-

sten Pressrolle (8) fort bewegt, um die genannte zweite Rolle daran zu hindern, sich an der Kante (1b) der Platte (1) zu verklemmen.

46. Vorrichtung nach Patentanspruch 45, **dadurch gekennzeichnet, dass** die zweite Rolle (14) an einer zweiten Führung (246) gleitet, die an dem mittleren Arm (18) angeordnet ist, und oben ein Nockenprofil (247) aufweist, das auf eine Nockenstößelrolle (248) wirkt, angeschlossen an Ventilmittel (249) zum Reduzieren des durch die zweiten Pressmittel (17) ausgeübten Druckes, welche auf solche Weise auf die zweite Rolle (14) wirken, dass deren Druck auf die Kante (1b) reduziert wird; wobei Federmittel (250) zwischen der zweiten Rolle (14) und dem mittleren Arm (18) wirken, um die anfänglichen Betriebsbedingungen wiederherzustellen.

#### Revendications

1. Une machine pour appliquer un placage de chants sur des panneaux (1), notamment des panneaux ayant des profils différemment conformés et pouvant être usinés sur des machines ayant au moins une table d'usinage (2) sur laquelle le panneau (1) est fermement maintenu et des moyens d'application (3) pour coller une bande de chant (4) sur un chant (1b), ladite machine comprenant lesdits moyens d'application (3) et ladite table d'usinage (2) qui sont mobiles l'un par rapport à l'autre, ladite machine étant **caractérisée en ce que** lesdits moyens (3) d'application de la bande de chant (4) sont constitués par un groupe ayant un arbre motorisé qui définit un axe principal (Z) vertical et qui supporte et entraîne au moins les éléments suivants :
  - un rouleau (6) de contact avec ledit chant (1b) du panneau (1), pouvant tourner librement autour de son axe vertical qui coïncide avec l'axe principal (Z) ;
  - des moyens (7) d'alimentation de colle ; et
  - au moins un premier rouleau de pression principal (8) destiné à exercer une pression sur ladite bande de chant (4), lesdits moyens (7) et ledit rouleau de pression (8) étant situés sur des côtés opposés du rouleau de contact (6) et pouvant osciller autour de l'axe principal (Z) en fonction du profil du panneau (1).
2. La machine selon la revendication 1, **caractérisée en ce que** lesdits moyens (7) d'alimentation de colle et ledit rouleau de pression principal (8) sont reliés à l'arbre qui définit l'axe principal (Z) de manière à pouvoir pivoter par rapport à l'ax (Z) en question pour suivre le profil du panneau (1).

3. La machine selon la revendication 1, **caractérisée en ce que** lesdits moyens (7) d'alimentation de colle sont reliés à l'arbre qui définit l'axe principal (Z) de manière à pouvoir se déplacer suivant une droite rectiligne et suivre ainsi le profil du panneau (1).
4. La machine selon la revendication 3, **caractérisée en ce que** lesdits moyens (7) d'alimentation de colle sont reliés à l'arbre qui définit l'axe principal (Z) par l'intermédiaire d'éléments de suspension (200) destinés à leur permettre d'osciller suivant une droite rectiligne et avec un mouvement irrotationnel dans un plan et le long de deux axes perpendiculaires à l'axe principal (Z).
5. La machine selon les revendications de 1 à 4, **caractérisée en ce que** ledit rouleau (6) est un rouleau qui applique de la colle sur ledit chant (1b) et est relié aux moyens (7) d'alimentation de colle qui distribuent la colle en question sur ce même rouleau (6).
6. La machine selon les revendications de 1 à 4, **caractérisée en ce que** ledit rouleau (6) est un rouleau de contact avec ledit chant (1b) et **en ce que** des moyens (100) sont prévus pour appliquer de la colle directement sur la bande de chant (4).
7. La machine selon la revendication 1, **caractérisée en ce que** ledit premier rouleau principal (8) de pression de la bande de chant (4) est placé en aval du rouleau de contact (6), par rapport à une direction (B) d'application de la bande de chant (4), peut tourner librement autour de son axe vertical et est relié à une première bielle (9) qui est associée de manière pivotante, à une extrémité, à l'arbre définissant l'axe principal (Z) ; la première bielle (9) étant reliée à des premiers moyens (10) destinés à presser le premier rouleau (8) contre le chant (1b) et à adapter en même temps la position angulaire de ce même rouleau par rapport à la position du rouleau de contact (6) en fonction du profil du chant (1b) en question du panneau (1) et de manière à maintenir pressé le premier rouleau (8) contre la bande de chant (4).
8. La machine selon les revendications de 1 à 4, **caractérisée en ce qu'elle** comprend des moyens (11) destinés à alimenter ladite bande de chant (4) dans la direction du chant (1b) du panneau (1), placés à proximité du rouleau de contact (6) et pouvant osciller, avec les moyens (7) d'alimentation de colle susmentionnés, autour de l'axe principal (Z) en fonction du profil du panneau (1).
9. La machine selon les revendications de 1 à 5, **caractérisée en ce qu'elle** comprend des moyens (11) destinés à alimenter ladite bande de chant (4)

- dans la direction du chant (1b) du panneau (1), placés à proximité du rouleau applicateur de colle (6) et pouvant osciller, avec les moyens (7) d'alimentation de colle susmentionnés, autour de l'axe principal (Z) en fonction du profil du panneau (1); lesdits moyens (11) d'alimentation de la bande de chant (4) étant réalisés de manière à définir un canal (12) à travers lequel la bande de chant (4), quand cela est requis, est alimentée au niveau du chant (1b) dans une zone (13) située entre le rouleau applicateur de colle (6) et le premier rouleau de pression principal (8).
10. La machine selon la revendication 1, **caractérisée en ce qu'elle** comprend un rouleau de pression secondaire (14) placé en aval du premier rouleau principal (8), par rapport à une direction (B) d'application de la bande de chant (4), et relié à une deuxième bielle (15) associée de manière pivotante, à une extrémité, à un premier arbre (16) relié à un premier bras central (18) qui supporte le premier rouleau principal (8) et définit un point de pivotement (G) du deuxième rouleau (14); des deuxièmes moyens de pression (17) étant prévus pour agir sur ce deuxième rouleau (14) et adapter sa position par rapport au premier rouleau (8) en fonction du profil du panneau (1) de manière à ce qu'il reste en contact avec la bande de chant (4).
11. La machine selon la revendication 7, **caractérisée en ce que** lesdits moyens (10) de pression et d'adaptation de la position du premier rouleau (8) sont constitués par ladite première bielle (9) pourvue d'une paire de roues dentées (19, 20) à chaque extrémité, dont l'une est calée de manière rigide sur l'arbre qui définit l'axe principal (Z); lesdites roues dentées (19, 20) ayant une première chaîne (21) enroulée autour d'elles; au niveau d'une branche (21a) de la chaîne (21), des premiers moyens d'entraînement (22) étant prévus, reliés à la première bielle (9) susmentionnée et agissant sur la première branche en question de manière à permettre à la bielle (9) de tourner dans les deux sens en fonction du profil du chant (1b); ladite première bielle (9) étant également pourvue d'un bras central (18) qui s'étend transversalement à la chaîne (21) et qui supporte de manière rotative, au niveau de son extrémité libre, le premier rouleau principal (8).
12. La machine selon la revendication 10, **caractérisée en ce que** lesdits deuxièmes moyens (17) de pression et d'adaptation sont constitués par une deuxième bielle (15) pourvue, à ses extrémités, de deuxièmes roues dentées (24, 25) correspondantes autour desquelles est enroulée une deuxième chaîne (26); la deuxième roue dentée (24) étant calée de manière rigide sur le premier arbre (16) et des deuxièmes moyens (27) étant prévus au niveau de l'autre roue dentée (25) pour mouvoir la deuxième bielle (15), en agissant sur la deuxième chaîne (26), et tourner le deuxième rouleau (14) par rapport à la position du premier rouleau (8) dans les deux sens, en fonction du profil du chant (1b) et de manière à maintenir ce même deuxième rouleau (14) en contact avec le chant.
13. La machine selon les revendications de 1 à 5, **caractérisée en ce que** lesdits moyens (7) d'alimentation de colle sont constitués par un bac à colle (28) placé dans un logement (29) prévu dans le groupe et situé à côté du rouleau applicateur (6); le bac à colle (28) étant pourvu d'une paire de rouleaux distributeurs (30) qui tournent librement autour des axes verticaux correspondants et sont placés entre ce même bac à colle (28) et le rouleau applicateur de colle (6) de manière à pouvoir distribuer uniformément la colle sur la surface extérieure de ce même rouleau (6).
14. La machine selon les revendications 8 et 9, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant (4) comprennent, à l'intérieur d'une structure de support et de couverture (31), au moins une paire de rouleaux motorisés (32) utilisés pour charger la bande de chant (4) et montés l'un en face de l'autre de manière à mouvoir la bande de chant (4) continue vers le chant (1b) dans une direction d'alimentation (D); des moyens (33) étant prévus pour détecter le passage de la bande de chant (4), placés en aval de la paire de rouleaux (32) par rapport à la direction d'alimentation (D) et agissant sur des moyens d'arrêt (34) correspondants placés en amont de la paire de rouleaux (32) par rapport à cette même direction d'alimentation (D) et destinés à arrêter l'alimentation de la bande de chant (4) en fonction de la position du groupe.
15. La machine selon la revendication 14, **caractérisée en ce que** lesdits moyens (33) de détection du passage de la bande de chant (4) sont constitués par au moins une paire d'unités optiques (35) placées l'une en face de l'autre.
16. La machine selon la revendication 14, **caractérisée en ce que** lesdits moyens d'arrêt (34) sont constitués par un élément presseur (36) agissant sur une section de la bande de chant (4) qui avance et par une paroi rectiligne (37) contre laquelle l'élément presseur (36) en question presse la bande de chant (4) pour l'arrêter.
17. La machine selon la revendication 14, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant (4) comprennent, en aval des moyens de détection (33) par rapport à la direction d'alimentation (D), un bras (38) destiné à guider et



- à distancer la bande de chant (4) d'un rouleau applicateur de colle (6), placé parallèlement à la bande de chant (4) et associé de manière pivotante à une extrémité, en (C), à la structure de support (31) ; ledit bras (38) étant pourvu de moyens d'entraînement (39) destinés à permettre à ce même bras de tourner au moins entre deux positions limites dont l'une est une position non opérationnelle, quand aucune bande de chant (4) n'est détectée, dans laquelle le bras (38) est éloigné d'une paroi (40) de guidage de la bande de chant (4), et au moins une position opérationnelle d'avancement, dans laquelle le bras (38) est rapproché de la paroi de guidage (40) et en contact avec la bande de chant (4) qui avance de manière à maintenir cette dernière sur une ligne d'avancement définie qui n'interfère pas avec le rouleau applicateur de colle (6).
18. La machine selon la revendication 14, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant (4) comprennent des moyens (41) de chauffage de la bande de chant (4) placés en amont des moyens d'arrêt (34) susmentionnés, par rapport à la direction d'alimentation (D), et destinés à rendre la bande de chant plus flexible quand cela est nécessaire.
19. La machine selon la revendication 18, **caractérisée en ce que** lesdits moyens de chauffage (41) comprennent une ou plusieurs unités (42) émettrices de rayons infrarouges à ondes courtes placées parallèlement entre elles et transversalement à la direction d'alimentation (D).
20. La machine selon la revendication 11, **caractérisée en ce que** ledit bras central (18) est pourvu de moyens (43) qui le bloquent dans une position fixe dans laquelle le premier rouleau principal (8) est éloigné du chant (1b) du panneau (1) quand un rouleau de contact (6) vient en contact avec le chant du panneau.
21. La machine selon la revendication 20, **caractérisée en ce que** lesdits moyens de blocage (43) comprennent un pivot vertical (44) relié avec le bras central (18) et qui peut se déplacer le long de son axe vertical entre une position basse non opérationnelle, dans laquelle le bras central (18) peut se déplacer, ce qui permet au premier rouleau principal (8) de venir en contact avec le chant (1b), et une position haute opérationnelle, dans laquelle le pivot (44) est en contact avec une paroi (45) solidaire d'une structure fixe (46) de la machine de manière à déterminer ladite position fixe ; ladite paroi fixe (45) ayant une vis de réglage (47) qui peut être placée en face du pivot (44) afin de varier la position dans laquelle le bras central (18) s'arrête par rapport à cette même vis de réglage de manière à régler la distance entre le premier rouleau (8) et le chant (1b) dans la position fixe.
22. La machine selon la revendication 7, **caractérisée en ce que** ledit premier rouleau principal (8) de pression de la bande de chant (4) est monté de manière à pouvoir tourner librement sur un premier arbre (101) monté au niveau de l'extrémité libre du bras central (18) de la première bielle (9) ; des premières bagues en caoutchouc (102, 103) correspondantes étant prévues sur les extrémités de l'arbre (101), lesquelles bagues étant destinées à donner au premier arbre (101) et au premier rouleau (8) une flexibilité axiale de manière à ce qu'ils puissent s'adapter à différentes formes lorsqu'ils viennent en contact avec la bande (4) appliquée sur le chant (1b).
23. La machine selon la revendication 10, **caractérisée en ce que** ledit deuxième rouleau (14) de pression de la bande de chant (4) est monté de manière à pouvoir tourner librement sur un deuxième arbre (105) monté sur la deuxième bielle (15) ; des deuxièmes bagues en caoutchouc (106, 107) correspondantes étant prévues sur les extrémités du deuxième arbre (105), lesquelles deuxièmes bagues en caoutchouc (106, 107) étant destinées à donner au deuxième arbre (105) et au deuxième rouleau (14) une flexibilité axiale de manière à ce qu'ils puissent s'adapter à différentes formes lorsqu'ils viennent en contact avec la bande (4) appliquée sur le chant (1b).
24. La machine selon les revendications 22 et 23, **caractérisée en ce que** lesdits premier et deuxième arbres (101, 105) des premier et deuxième rouleaux (8, 14) correspondants sont reliés entre eux de manière rigide au niveau de leurs extrémités inférieures par l'intermédiaire d'un unique élément de support (104) ayant une colonne verticale (108) reliée à la deuxième bielle (15).
25. La machine selon la revendication 6, **caractérisée en ce qu'elle** comprend un élément de guidage (40) placé à côté du rouleau de contact (6), ledit élément de guidage (40) étant constitué par une pale (109) montée sur une tige (110) qui coulisse axialement entre une position non opérationnelle, dans laquelle la pale (109) est éloignée du rouleau de contact (6), et une position opérationnelle dans laquelle la pale (109) est rapprochée des moyens (100) d'application de colle et s'oppose à la bande de chant (4), du côté opposé à celui sur lequel la colle est appliquée.
26. La machine selon les revendications 8 et 9, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant (4) et lesdits moyens (7) d'alimentation de colle sont équipés de moyens

- (110) destinés à adapter leur position, c'est-à-dire, à les faire pivoter par rapport à l'axe principal (Z) en fonction du profil du panneau (1).
27. La machine selon la revendication 26, **caractérisée en ce que** lesdits moyens d'adaptation (110) sont constitués par une structure (31) qui supporte et recouvre les moyens (11) d'alimentation de la bande de chant et les moyens (7) d'alimentation de colle et qui est libre de tourner autour de l'axe principal (Z), la partie supérieure de la structure (31) étant pourvue d'un guide linéaire (111) qui est couplé de manière coulissante à un contre-guide (112) réalisé sur une plaque de montage principale (113) qui est reliée de manière rotative à l'arbre définissant l'axe principal (Z) ; la plaque de montage principale (113) comprenant des moyens (114) qui la meuvent et meuvent également la structure de support (31) et qui sont destinés à permettre à la plaque (113) et à la structure de support (31) de pivoter par rapport à l'axe principal (Z) dans les deux sens.
28. La machine selon les revendications 1, 3 et 4, **caractérisée en ce que** lesdits éléments de suspension (200) sont placés entre la plaque de montage principale (113), qui est reliée à l'arbre définissant l'axe principal (Z), et une structure de couverture (31) qui loge les moyens (7) d'alimentation et les moyens (11) d'alimentation de la bande de chant.
29. La machine selon la revendication 28, **caractérisée en ce que** lesdits moyens de suspension (200) sont constitués par trois paires séparées de bielles (201, 202, 203) placées entre la plaque de montage (113) et la structure de couverture (31) et reliées à ces dernières au niveau de points extrêmes correspondants ; les bielles (201, 202, 203) étant également reliées entre elles au niveau de points intermédiaires correspondants par le biais d'un élément rigide (204) essentiellement en forme de "Y".
30. La machine selon la revendication 28, **caractérisée en ce qu'elle** comprend des moyens (205, 206) placés entre la plaque principale (113) et la structure de couverture (31) et utilisés pour contrôler la position de cette même structure de couverture (31) par rapport à l'axe principal (Z), c'est-à-dire, par rapport au profil du chant (1b) du panneau (1).
31. La machine selon la revendication 28, **caractérisée en ce que** lesdits moyens de contrôle de la position sont constitués par une paire de vérins (205, 206) montés à angle droit l'un par rapport à l'autre et associés à la structure de couverture (31), à une extrémité, et à un unique pivot de référence vertical (207) avec la tige correspondante ; le pivot vertical (207) étant aligné sur une ouverture (208) réalisée dans la plaque principale (113) et de l'autre côté de laquelle il y a un capteur inductif (209) logé dans cette même plaque (113) et destiné à détecter la présence du pivot (207) au niveau de l'ouverture (208) et à arrêter toute la machine lorsque le pivot (207) s'éloigne de l'ouverture (208), indiquant que la structure de couverture (31) est dans la mauvaise position par rapport au profil du chant (1b).
32. La machine selon les revendications 8 et 9, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant comprennent un chariot (210) destiné à guider et à amener la bande de chant (4) à proximité du chant (1b), au démarrage du cycle d'usinage, et équipé d'une base fixe (211) et d'une paire de bras (212, 213) placés en face de la base (211) de manière à définir un canal pour le passage de la bande de chant ; un vérin (214) étant prévu pour agir sur le chariot (210), ledit vérin (214) étant relié à la structure de couverture (31) et étant destiné à mouvoir le chariot (210) entre une position rentrée non opérationnelle et une position sortie opérationnelle dans laquelle il amène la bande de chant (4) à proximité du chant (1b).
33. La machine selon la revendication 32, **caractérisée en ce que** la tige du vérin (214) est reliée à l'extrémité du bras (212), qui est en forme de "L" et associé de manière pivotante en (F212) au corps du chariot (210) de manière à pouvoir tourner une portion de la bande de chant (4) dans une position de blocage durant le passage de la position rentrée à la position sortie, sous l'action de poussée du vérin (214), puis de tourner la bande de chant (4) en sens inverse dans une position de déblocage lorsqu'elle est appliquée sur le chant (1b), ledit déblocage étant effectué en faisant avancer un peu plus uniquement le chariot (210) tout en maintenant la tige fixe.
34. La machine selon les revendications 8 et 9, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant comprennent un bras (215) qui applique de la colle sur la bande de chant (4), ce bras (215) étant pourvu d'un contre-rouleau (216) au niveau de son extrémité libre et d'un vérin (217) qui le meut entre une position non opérationnelle, dans laquelle il est éloigné du rouleau applicateur de colle (6), et une position opérationnelle dans laquelle il est rapproché du rouleau applicateur de colle (6), avec la bande de chant (4) entre le rouleau (6) et le contre-rouleau (216).
35. La machine selon les revendications 8, 9 et 14, **caractérisée en ce que** les deux rouleaux (32) susmentionnés qui alimentent et chargent la bande de chant (4) ont des éléments cinématiques (218) correspondants qui leur permettent de tourner dans la direction d'alimentation (D) indépendamment du sens de rotation du rouleau applicateur de colle (6).

36. La machine selon les revendications 14 et 35, **caractérisée en ce que** lesdits éléments cinématiques (218) sont constitués par une paire de premières roues dentées (218a, 218b) calées sur un unique arbre de rotation (219) relié aux rouleaux d'alimentation (32), lesdites premières roues dentées (218a, 218b) étant logées dans la partie supérieure de la structure de couverture (31) des moyens (11) d'alimentation de la bande de chant ; chacune des deux premières roues dentées (218a, 218b) engrenant des deuxièmes roues dentées (220, 221) correspondantes qui sont associées à des organes d'entraînement (222) de la machine, sont reliées à l'arbre définissant l'axe principal (Z) et sont mues dans des sens de rotation contraires ; chacune des premières roues dentées (218a, 218b) étant pourvue de moyens (218c) à roue libre destinés à lui permettre de tourner librement sur l'arbre (219) quand l'arbre définissant l'axe principal (Z) tourne dans un sens de rotation opposé à son propre sens de rotation.
37. La machine selon les revendications 8 et 9, **caractérisée en ce que** lesdits moyens (11) d'alimentation de la bande de chant comprennent des moyens (223) destinés à détecter la longueur de la bande de chant (4) et à couper cette même bande de chant (4) quand celle-ci a fait tout le tour du panneau et rejoint l'extrémité initiale (4a) qui a été appliquée en premier.
38. La machine selon les revendications 8, 9, 14 et 37, **caractérisée en ce que** lesdits moyens de détection (223) sont constitués par une tige (224) associée de manière pivotante en (F224) à la structure de couverture (31) et destinée à tourner entre une position non opérationnelle dans laquelle elle est rentrée à l'intérieur de la structure de couverture (31), et une position opérationnelle dans laquelle elle dépasse de la structure, quand cela est nécessaire, et vient se placer à proximité du chant (1b) avec une partie en contact avec la surface de dessous du panneau (1) à plaquer ; la tige (224) étant pourvue de capteurs de présence (225, 226) placés l'un en face de l'autre et destinés à détecter l'extrémité initiale (4a) de la bande de chant (4) et à envoyer un signal à une unité de commande (50) qui traite ce signal et active un groupe de coupe en bout (227) placé à proximité du canal (12) de passage de la bande de chant (4).
39. La machine selon la revendication 38, **caractérisée en ce que** ledit groupe de coupe en bout (227) est constitué par un couteau circulaire (228) monté sur une base (229) qui est reliée de manière coulissante à la structure de couverture (31) et reliée à un vérin d'entraînement (230).
40. La machine selon la revendication 13, **caractérisée en ce que** les deux rouleaux distributeurs de colle (30) sont pourvus de moyens d'entraînement (231) indépendants destinés à les ouvrir et fermer ; les moyens d'entraînement (231) étant constitués par un arbre vertical (232, 233) de liaison de chaque vérin (30), chaque arbre (232, 233) étant pourvu d'une tige (234), perpendiculaire à l'arbre correspondant, assujettie à des moyens à came (235) qui sont à leur tour assujettis à des moyens d'entraînement (236) de manière à ouvrir un rouleau distributeur (30) et à fermer l'autre, et inversement.
41. La machine selon la revendication 40, **caractérisée en ce que** lesdites deux tiges (234) ont des moyens à ressort (237) destinés à les maintenir espacées de manière à maintenir fermés les rouleaux distributeurs (30) correspondants quand les moyens d'entraînement (236) sont dans la position non opérationnelle.
42. La machine selon la revendication 40, **caractérisée en ce que** lesdits moyens à came (235) sont constitués par un chariot tubulaire (238) à l'intérieur duquel les arbres (232, 233) peuvent être partiellement logés, chaque arbre ayant un pivot suiveur de came (239) placé en contact avec les profils à came (240) correspondants réalisés sur une paroi du chariot (238) de sorte que, quand les moyens d'entraînement (236), qui consistent en un vérin pneumatique relié au chariot (238), sont activés, l'un ou l'autre des rouleaux distributeurs (30) est ouvert.
43. La machine selon la revendication 11, **caractérisée en ce que** ledit premier rouleau de pression (8) peut coulisser le long du bras de support central (18) de sorte que son axe de rotation s'éloigne de l'axe principal (Z) de manière à empêcher ce même premier rouleau d'encombrer le chant (1b) du panneau (1).
44. La machine selon les revendications 11 et 43, **caractérisée en ce que** ledit premier rouleau (8) coulisse sur un premier guide (241) et présente, supérieurement, un profil à came (242) qui agit sur un galet suiveur de came (243) relié à un élément (244) utilisé pour ajuster la pression exercée par les premiers moyens de pression (10) de manière à adapter la position du premier rouleau (8) et à réduire la pression du premier rouleau (8) exercée sur le chant (1b) quand le rouleau s'éloigne de l'axe principal (Z) ; des moyens (245) étant prévus pour agir sur les premiers moyens de pression (10) afin de rétablir les conditions d'usage initiales.
45. La machine selon la revendication 12, **caractérisée en ce que** ledit deuxième rouleau de pression (14) coulisse le long du bras central (18) de sorte que son axe de rotation s'éloigne de l'axe principal (Z)

et du premier rouleau de pression (8) de manière à empêcher ce même deuxième rouleau d'encombrer le chant (1b) du panneau (1).

46. La machine selon la revendication 45, caractérisée 5  
en ce que ledit deuxième rouleau (14) coulisse sur  
un deuxième guide (246) situé sur le bras central  
(18) et présente, supérieurement, un profil à came  
(247) qui agit sur un galet suiveur de came (248)  
relié à des moyens de régulation à vanne (249) uti- 10  
lisés pour réduire la pression exercée par les  
deuxièmes moyens de pression (17) agissant sur  
le deuxième rouleau (14) de manière à réduire la  
pression qu'il exerce sur le chant (1b) ; des moyens  
à ressort (250) agissant entre le deuxième rouleau 15  
(14) et le bras central (18) pour rétablir les condi-  
tions d'usinage initiales.

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FIG.1

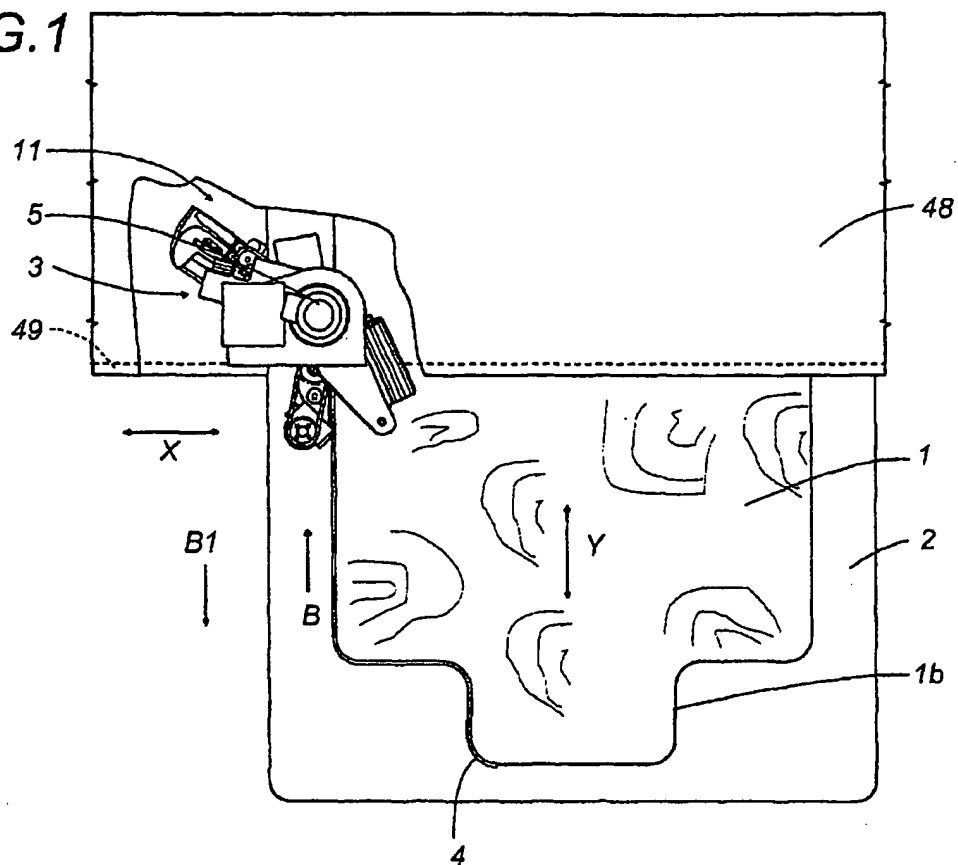


FIG.17

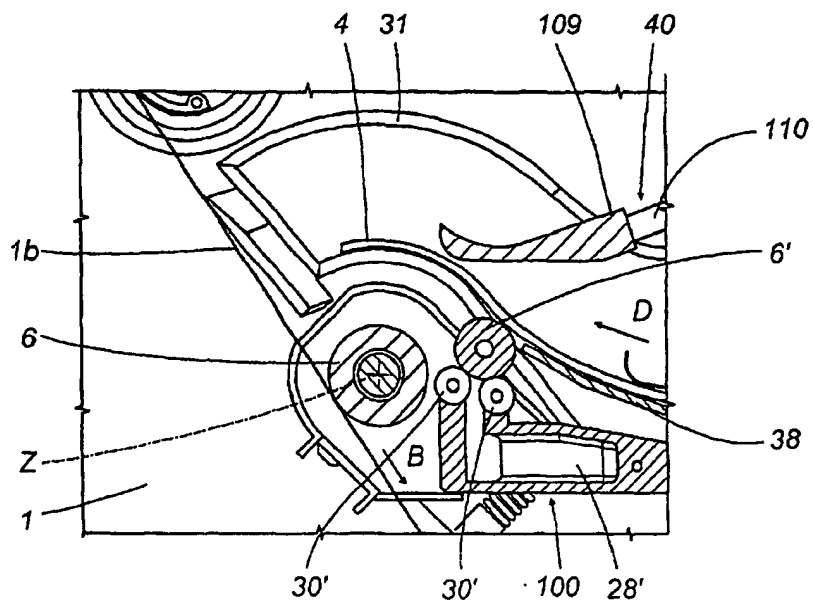


FIG.2

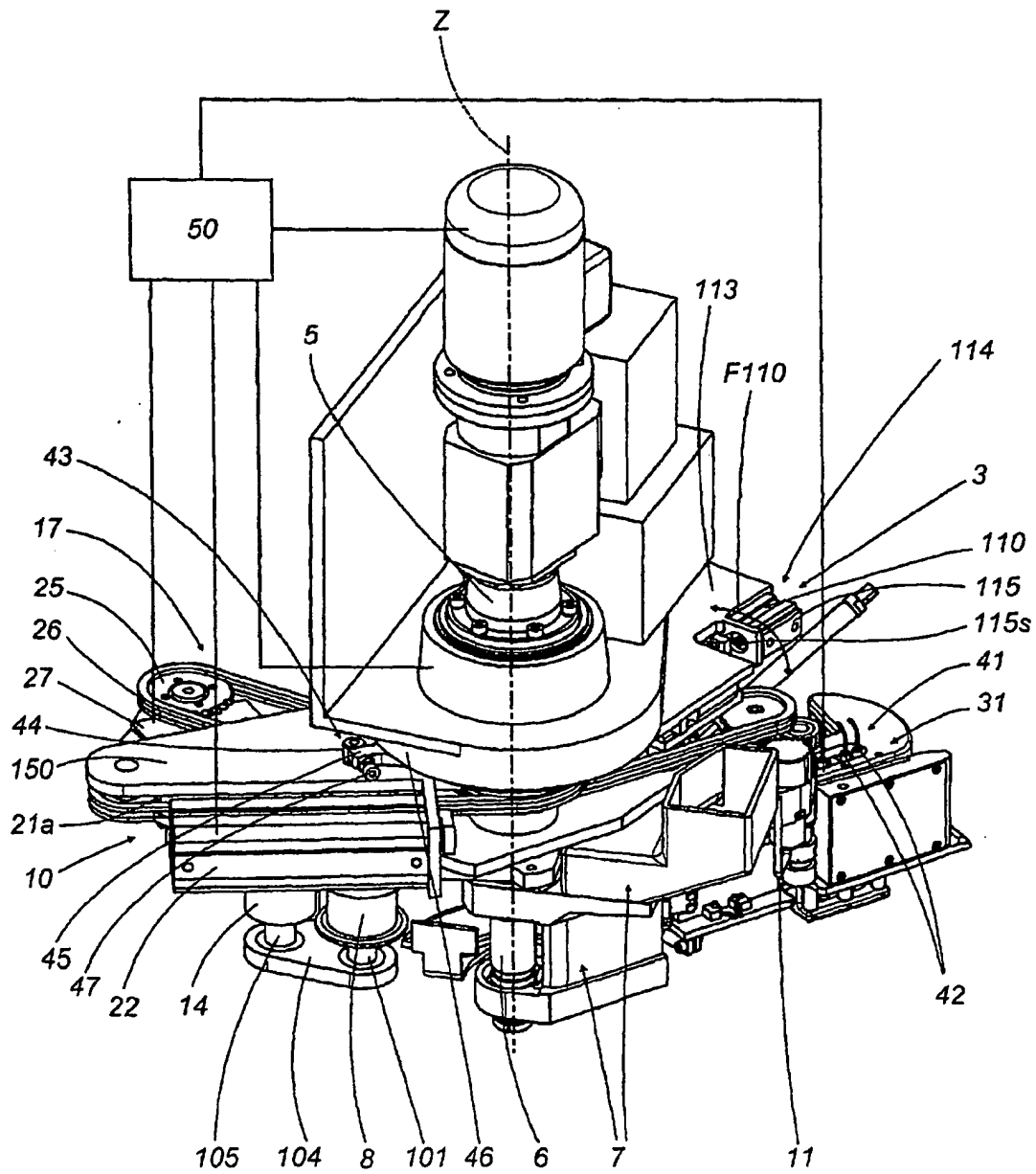


FIG.3

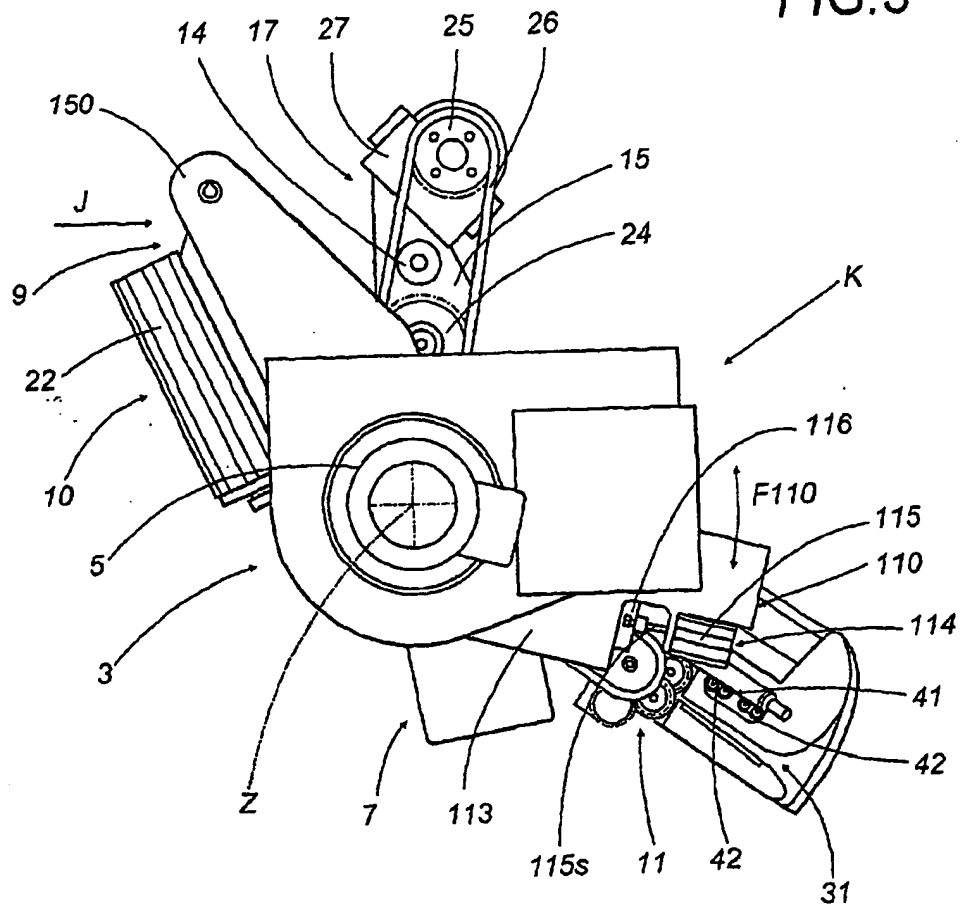


FIG.5

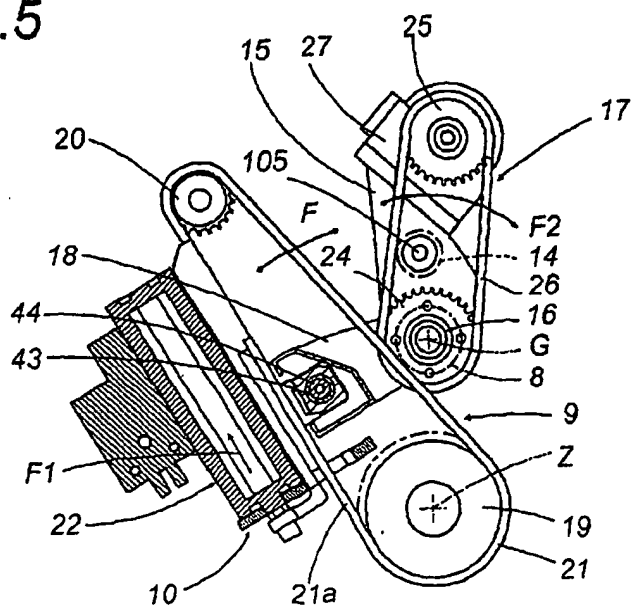
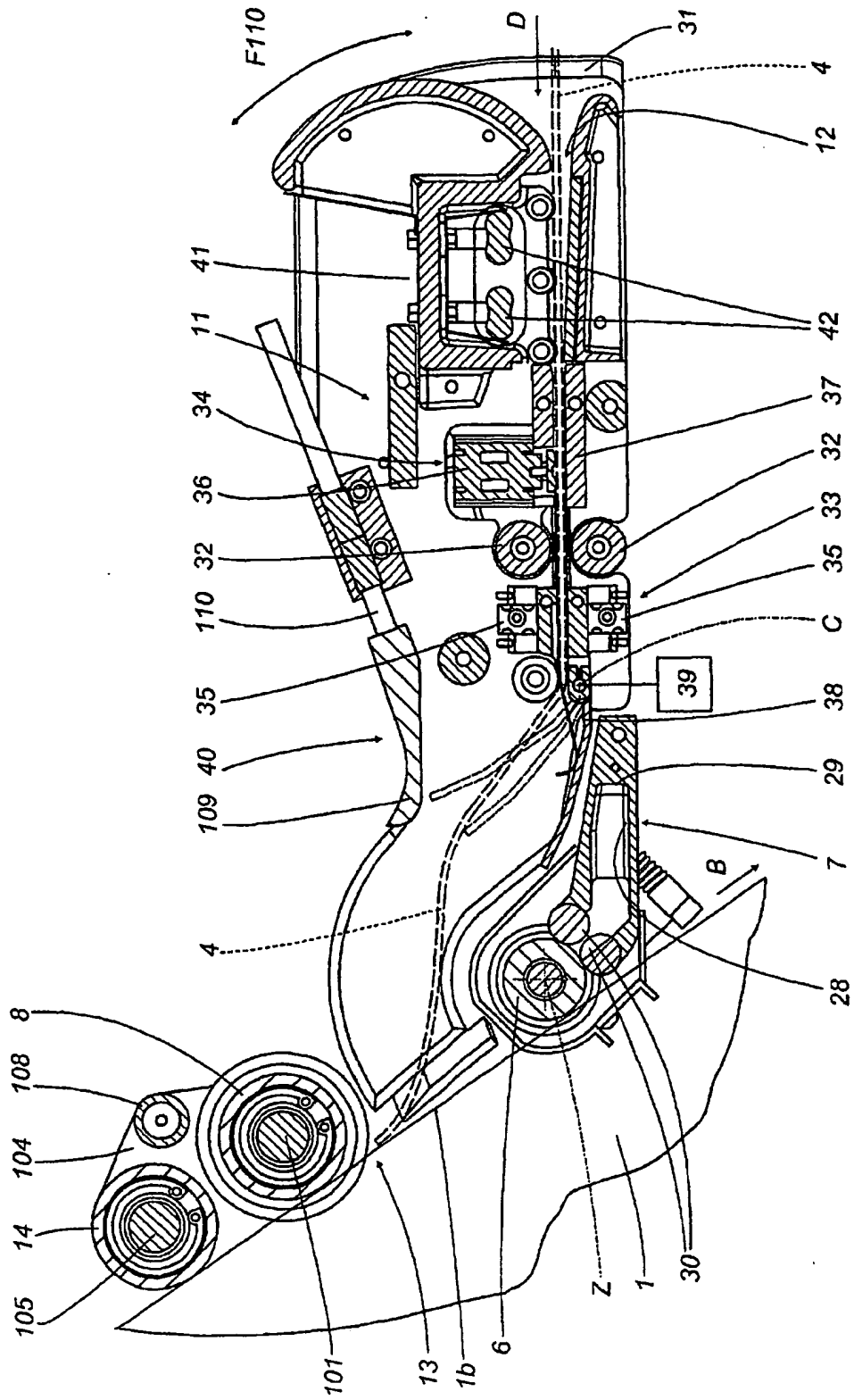
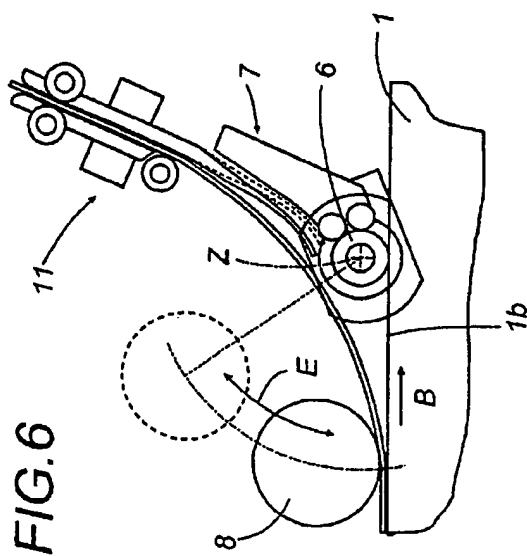


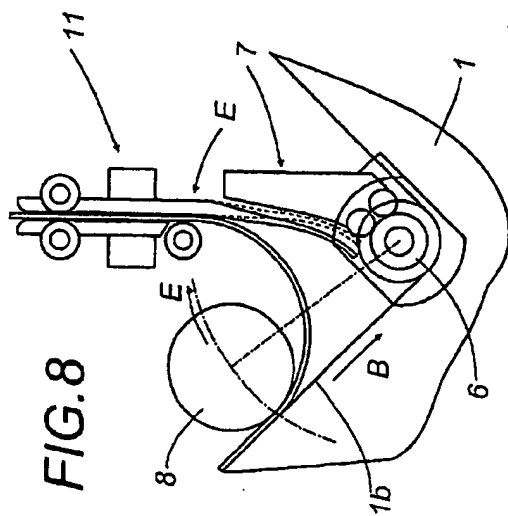
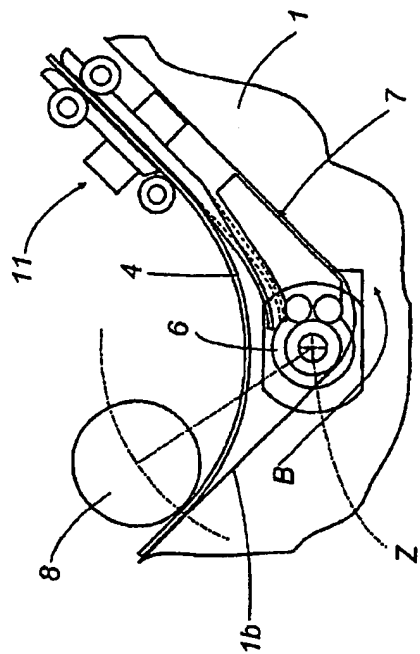
FIG.4



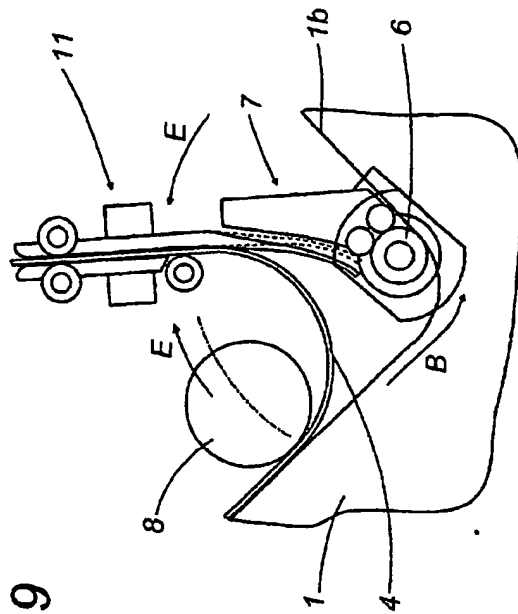


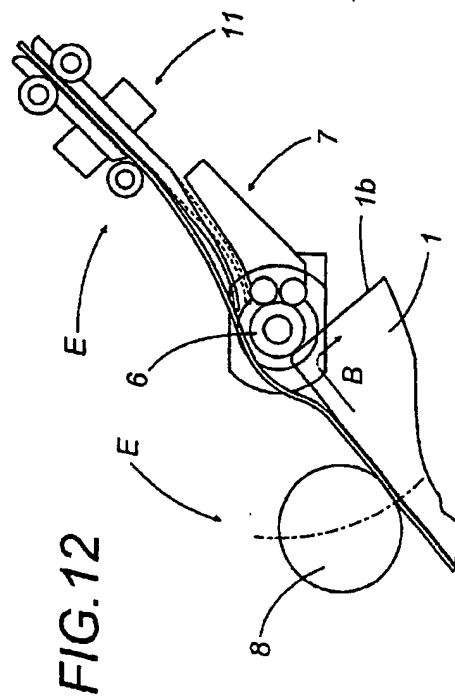
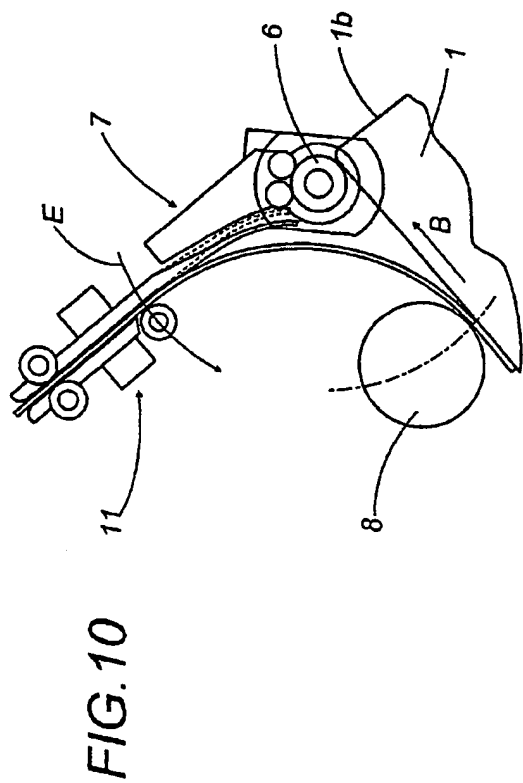
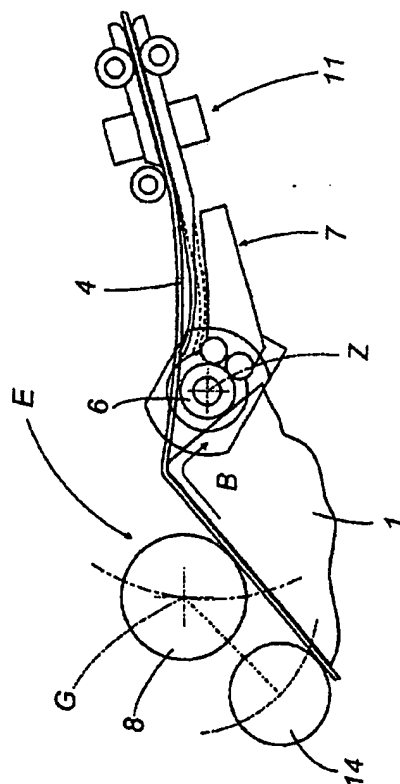
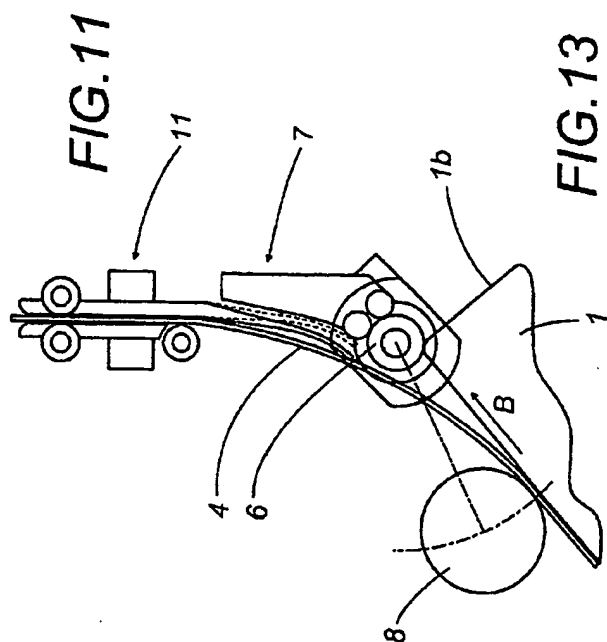


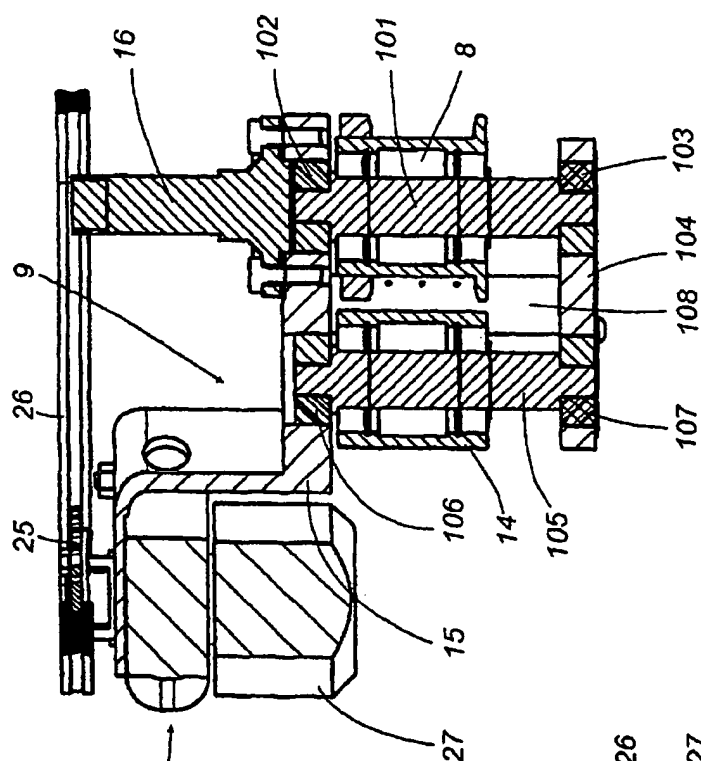
**FIG.7**



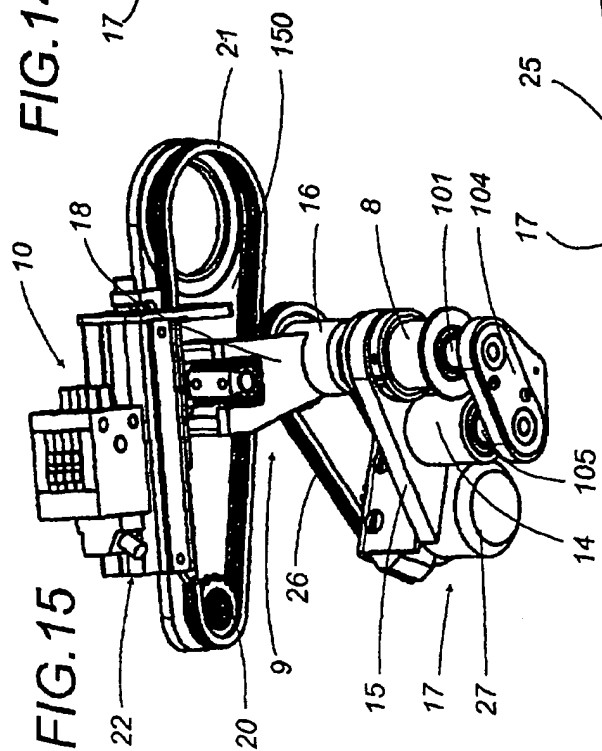
**FIG.9**







**FIG. 14**



**FIG. 15**

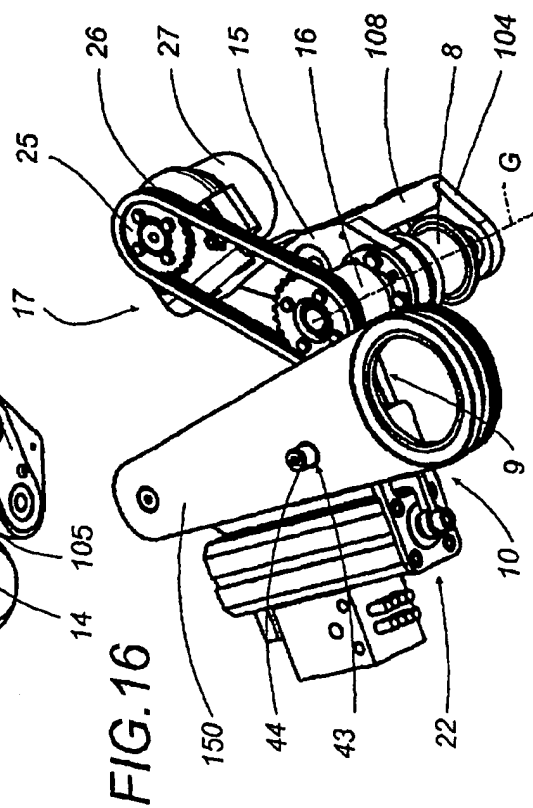
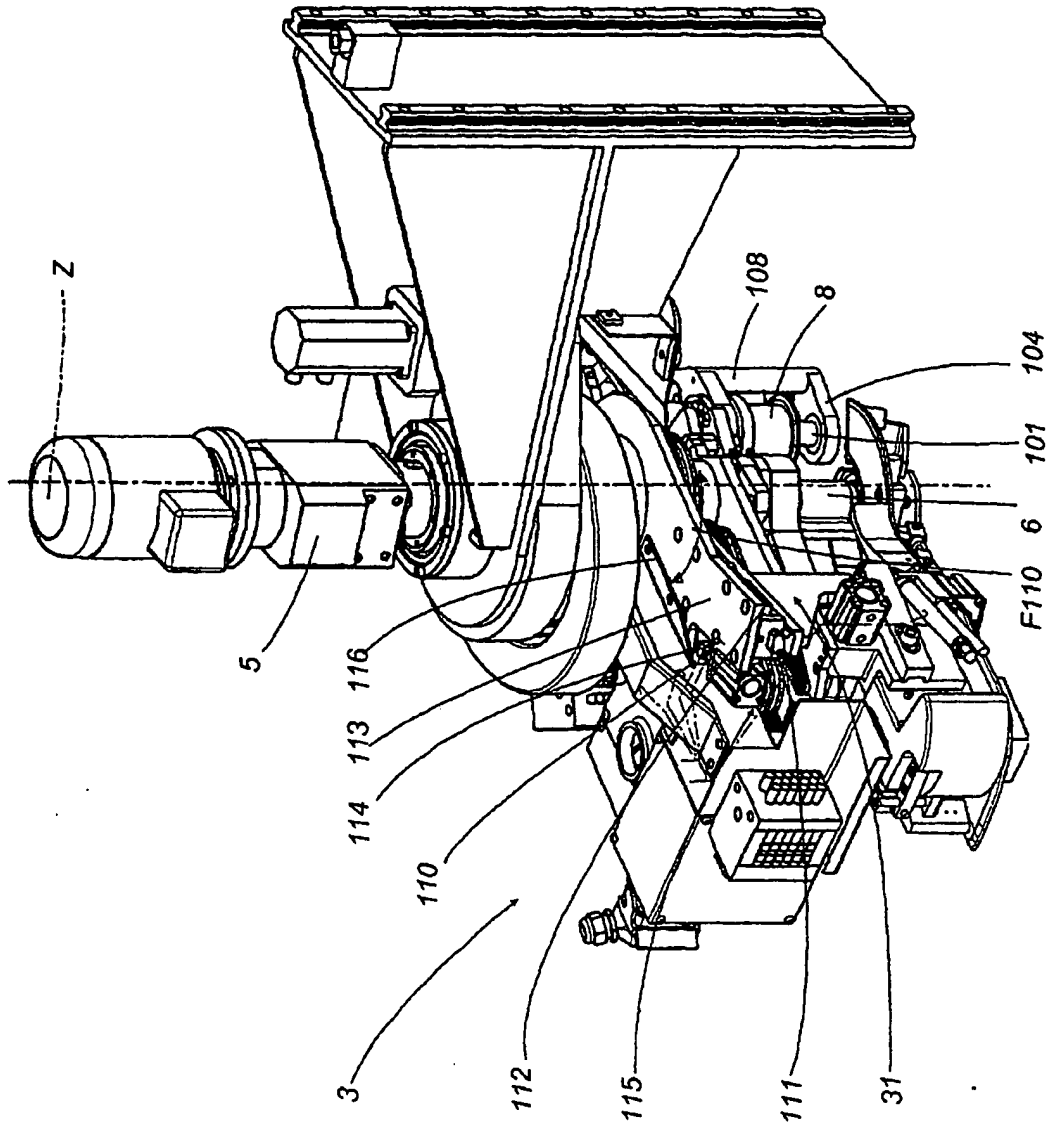


FIG. 16

FIG.18



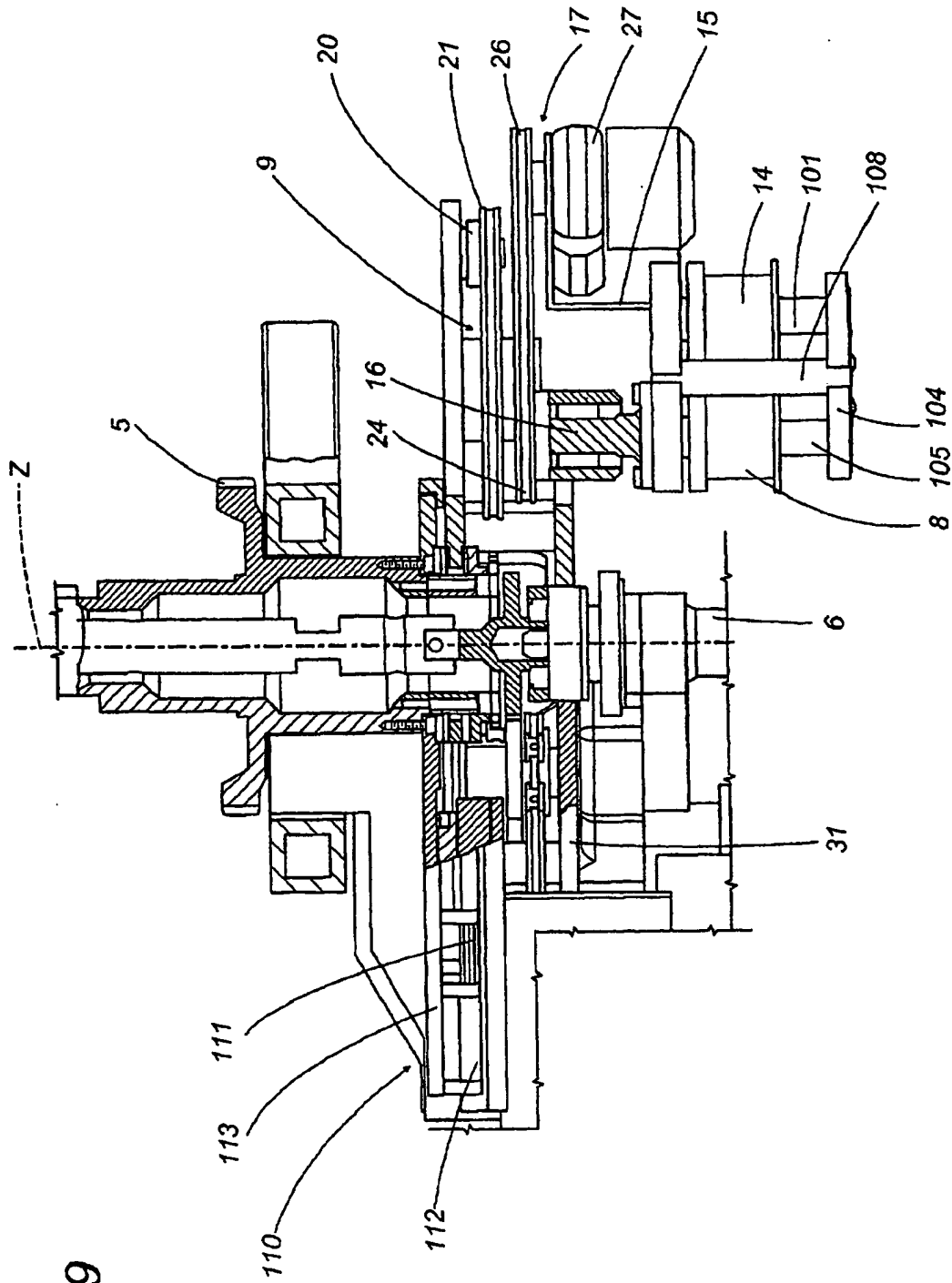


FIG. 19

FIG.20

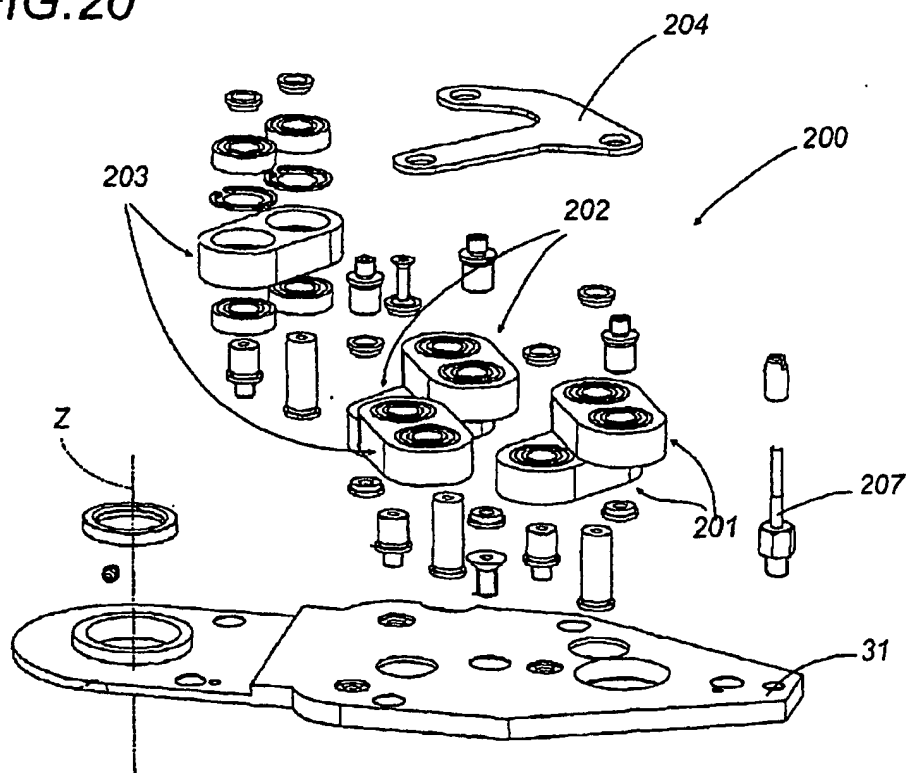
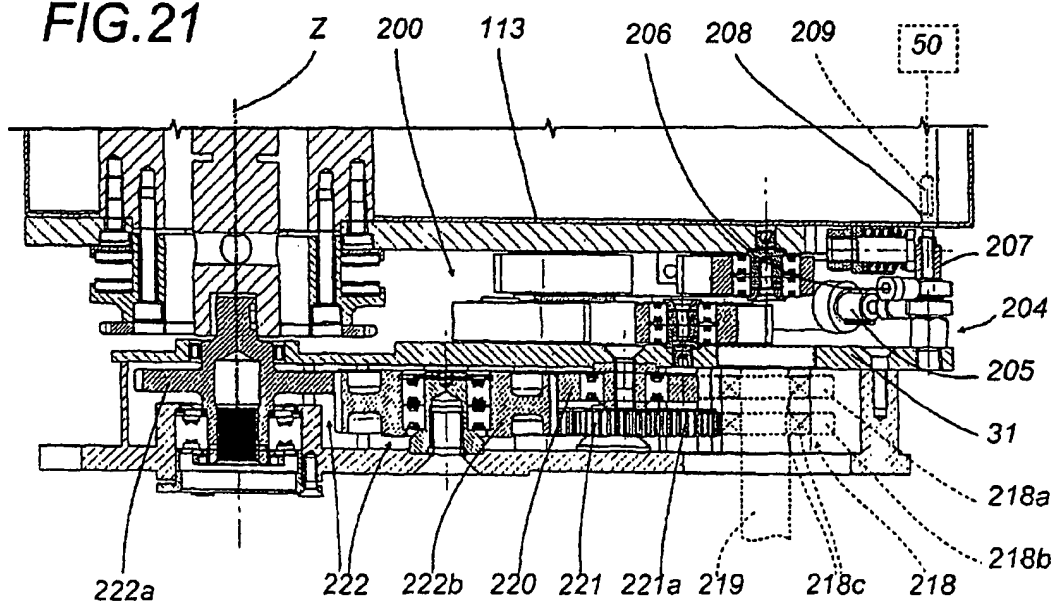


FIG.21



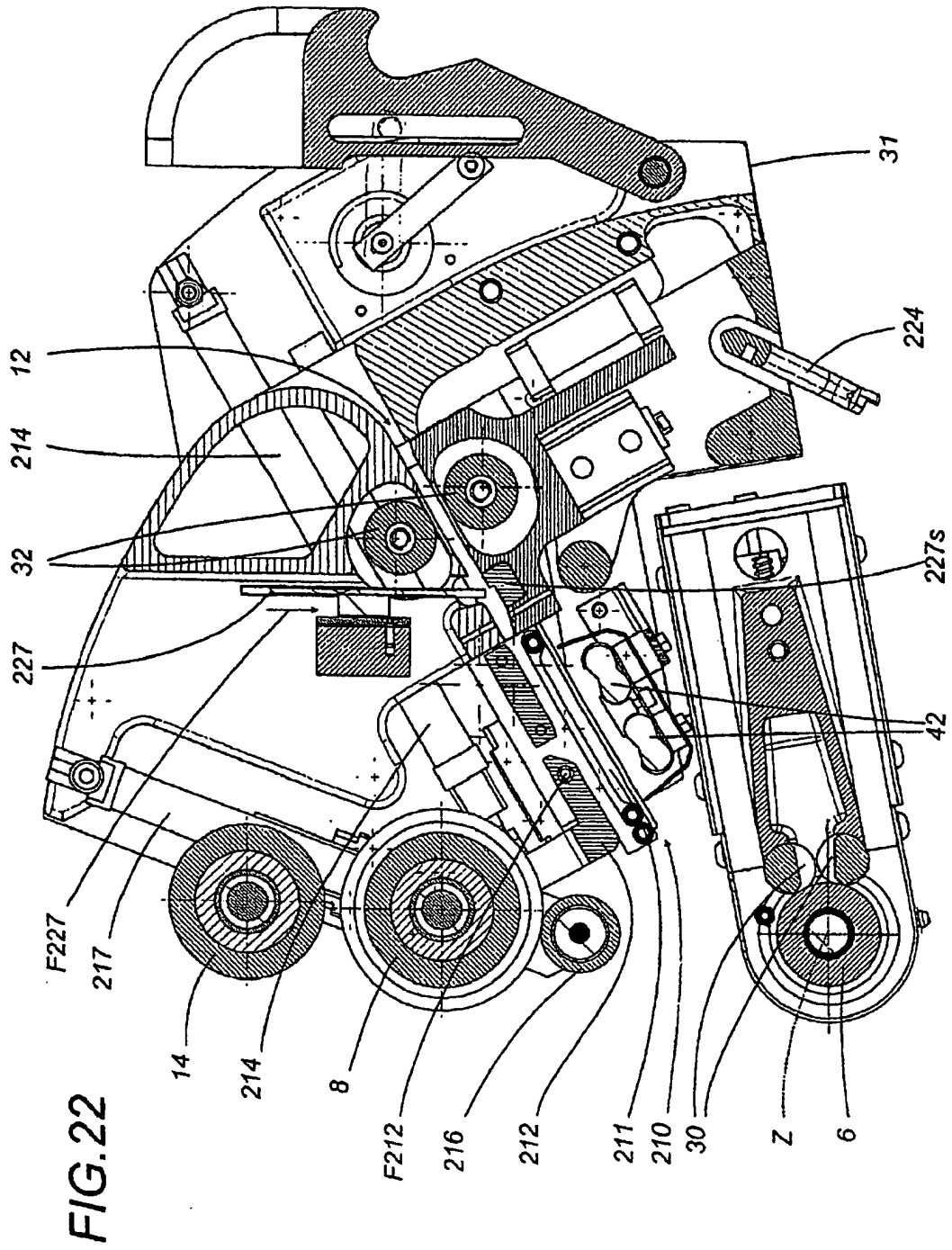
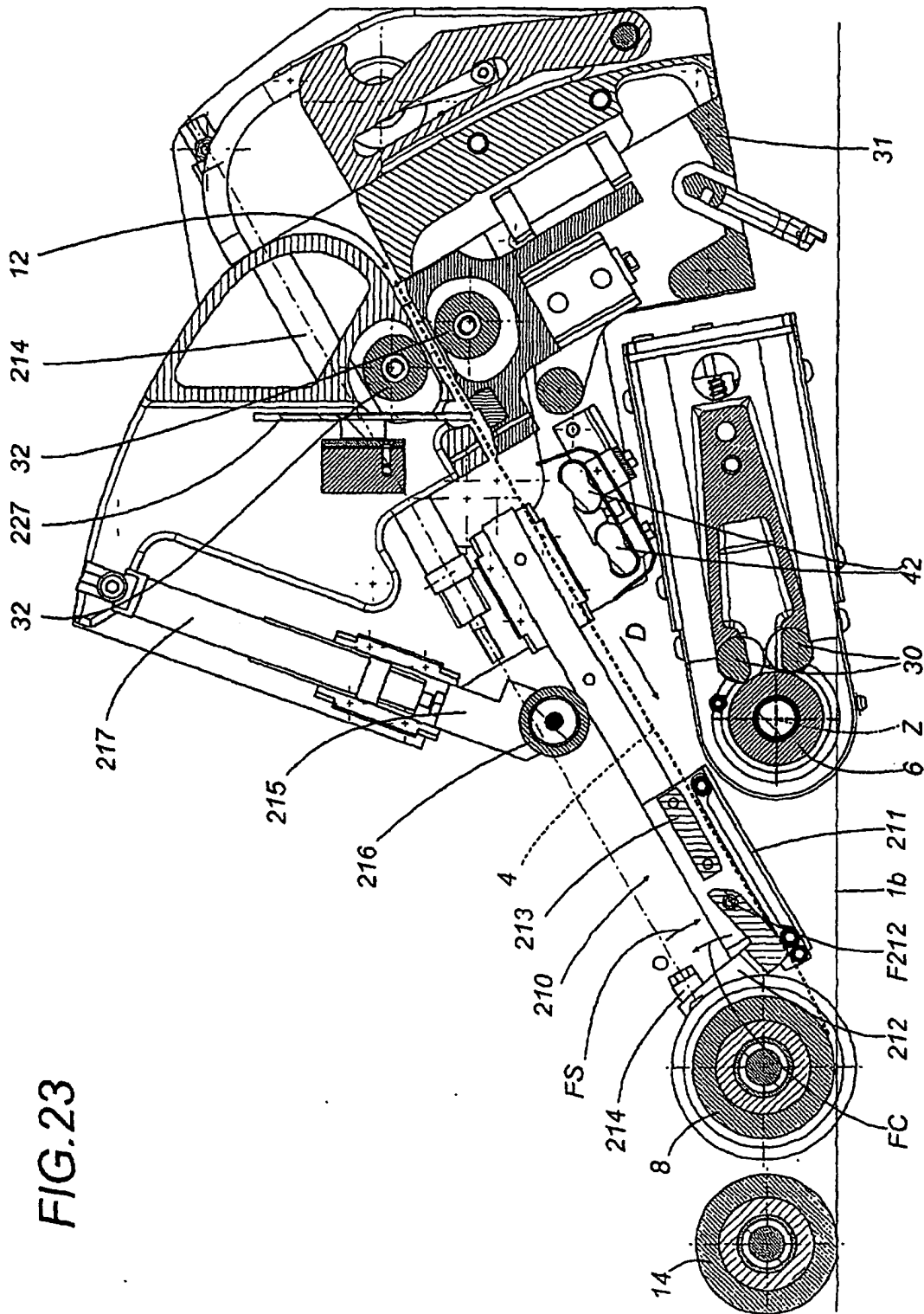


FIG.23





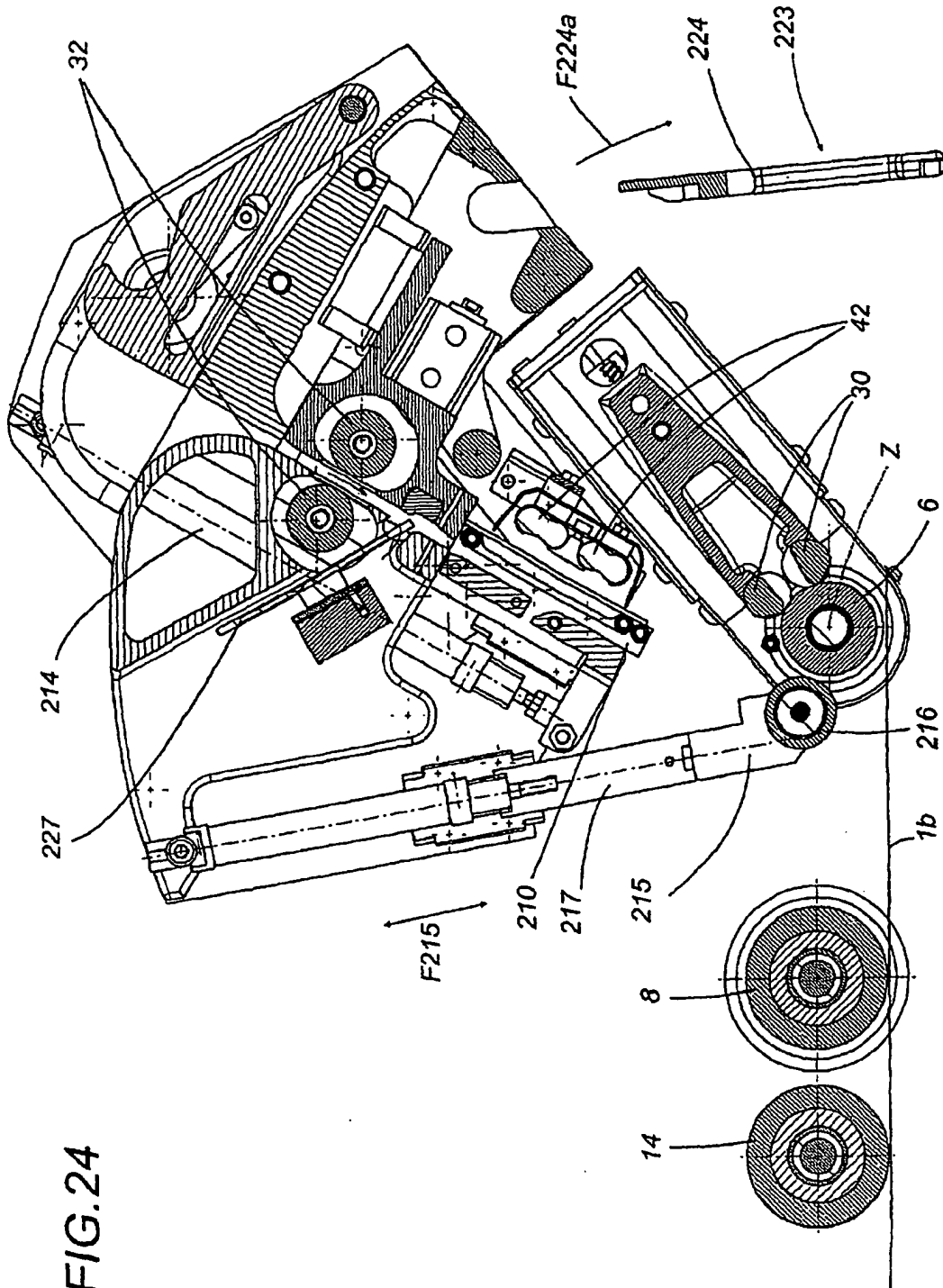


FIG. 24

FIG.25

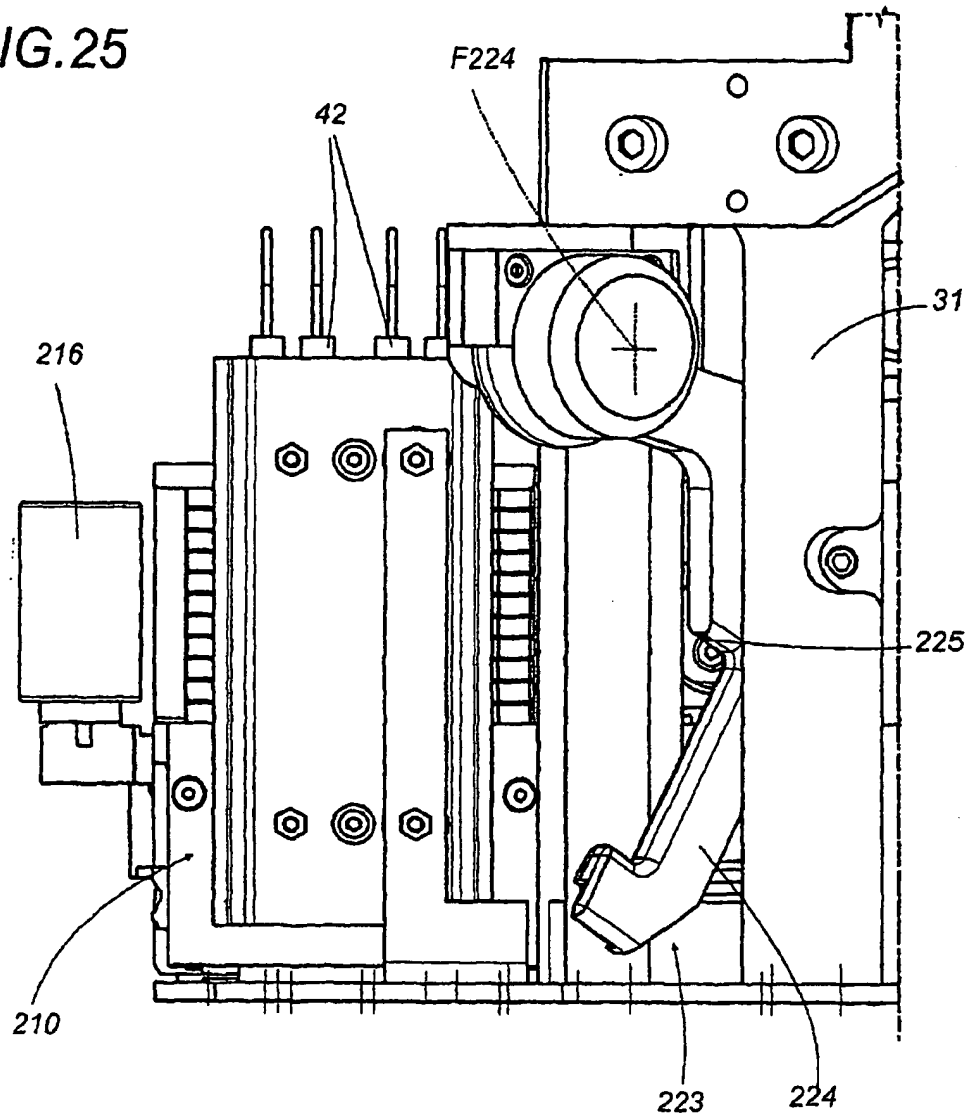
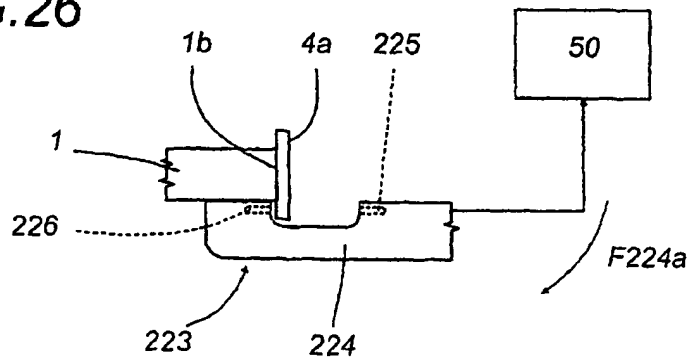


FIG.26



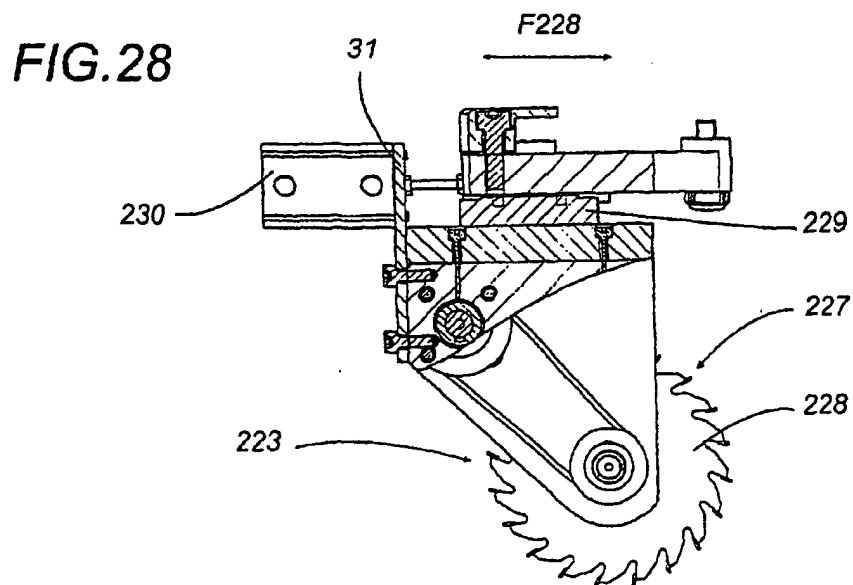
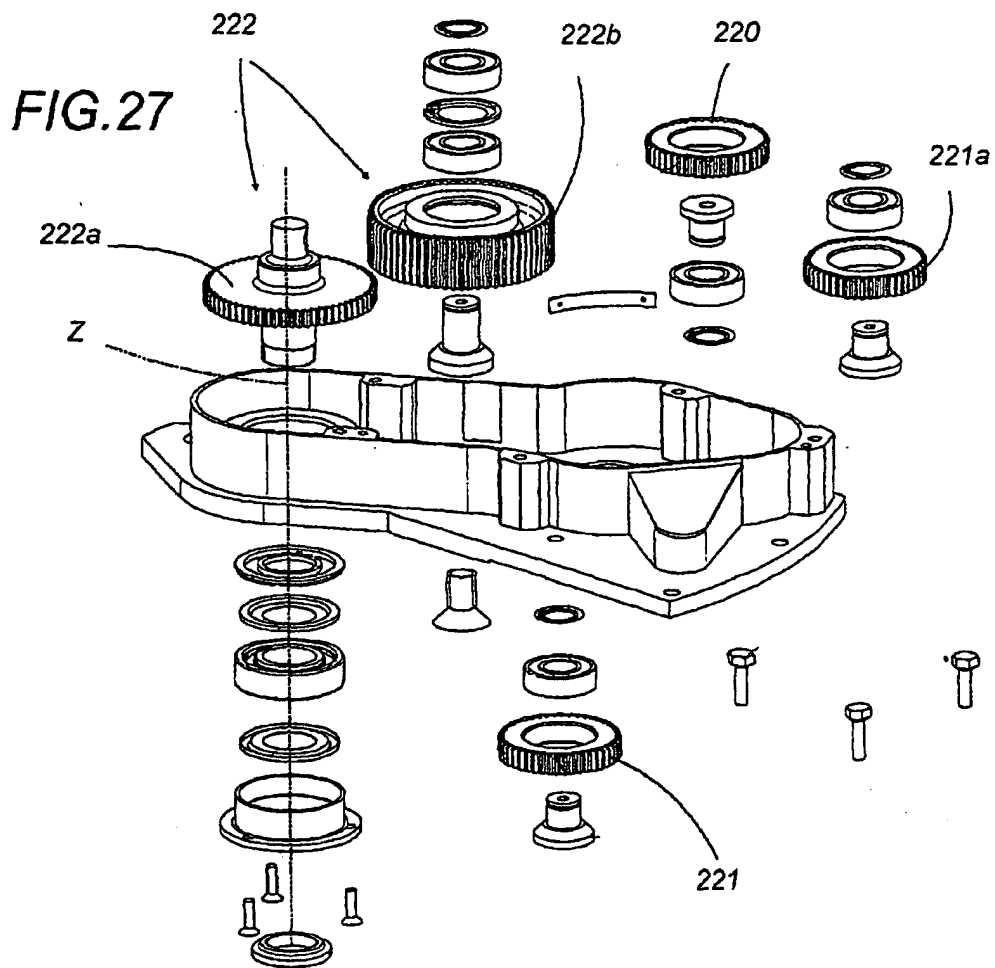


FIG. 29

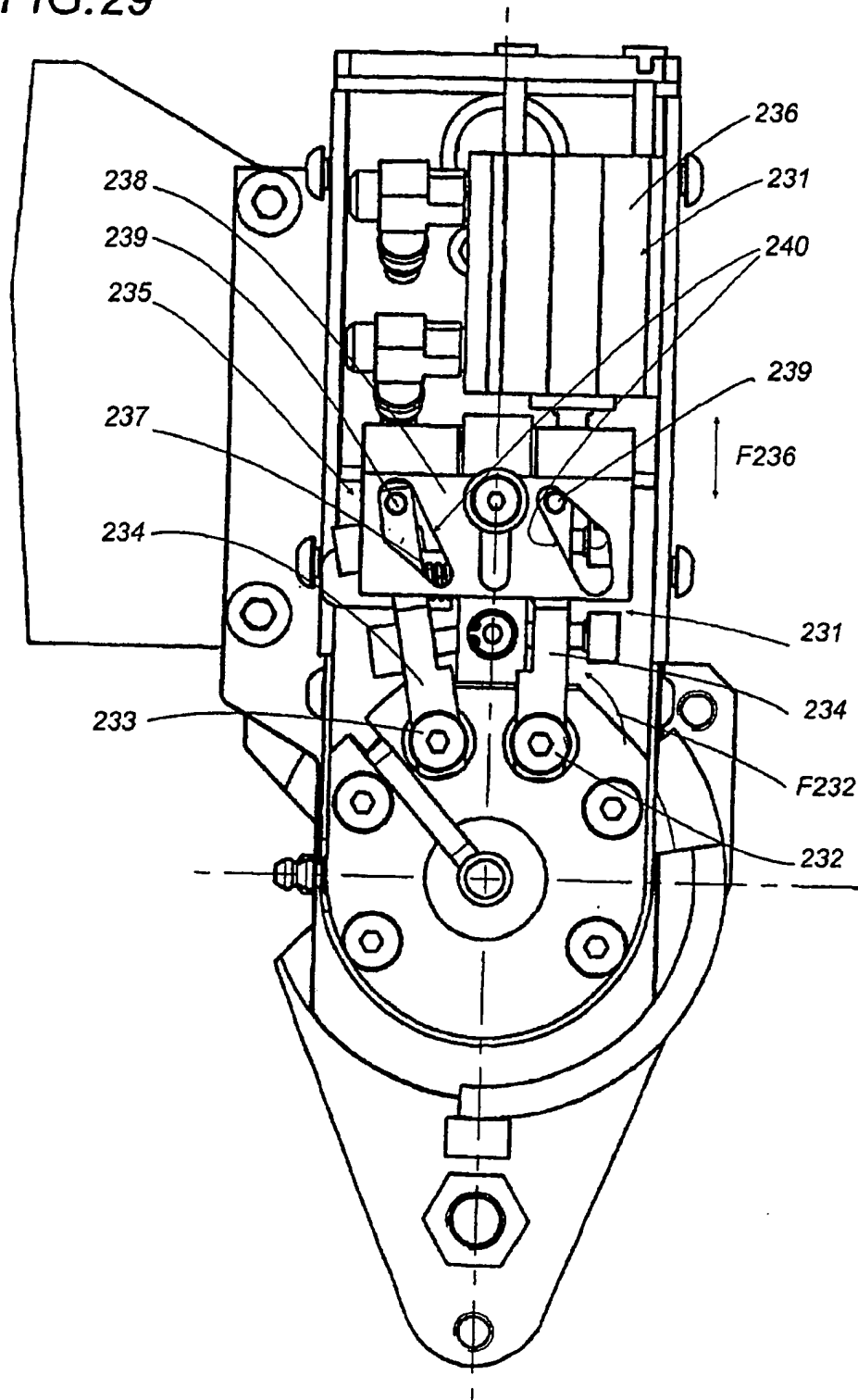


FIG. 30

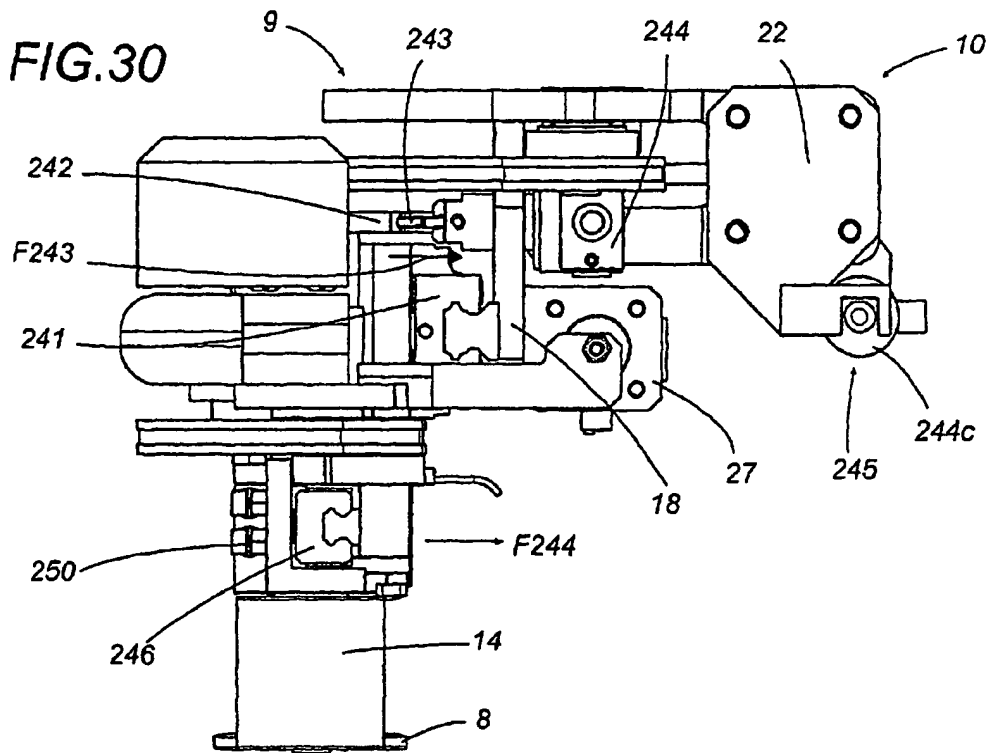


FIG.31

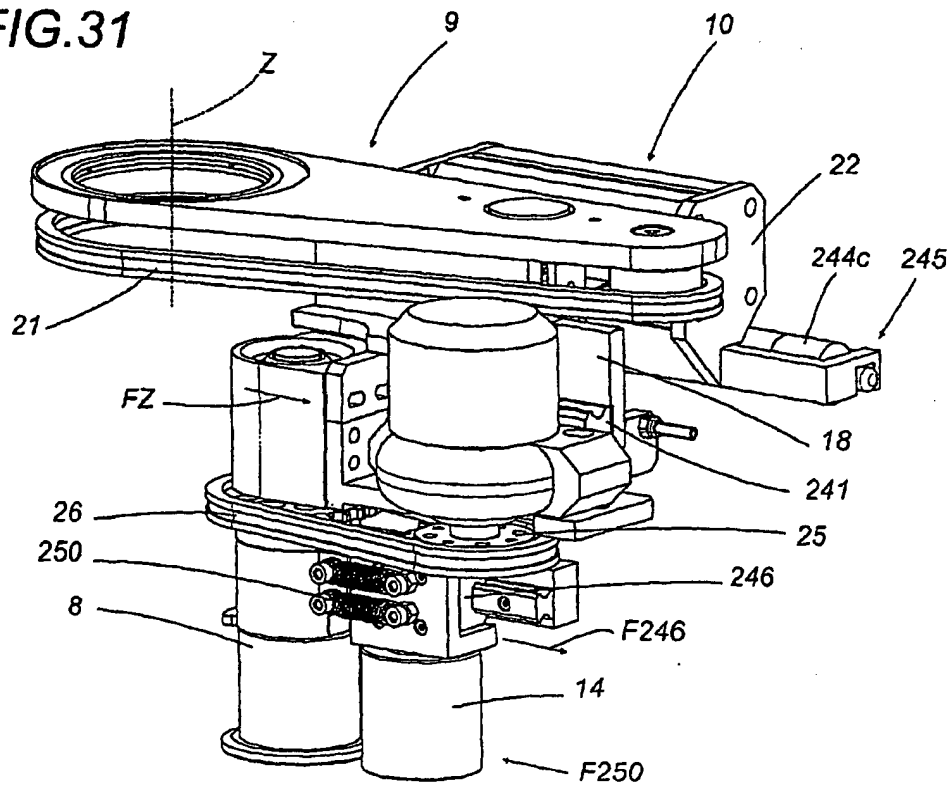


FIG.33

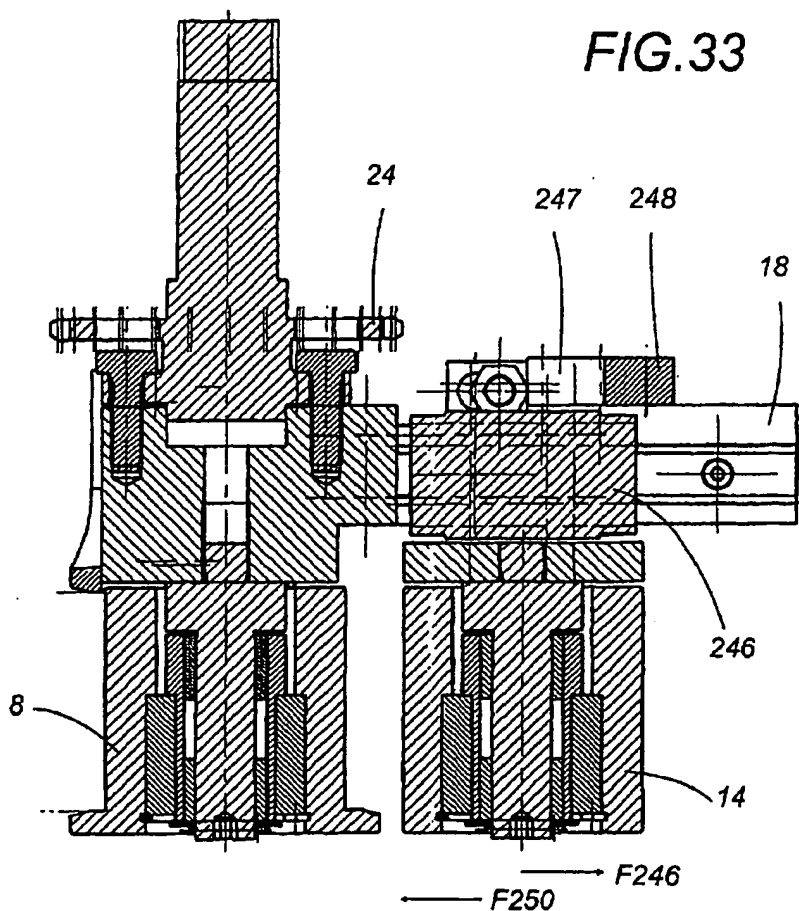


FIG.32

